Dealer's Manual

SHIMANO ALFINE S705 Series

SG-S705
SG-S505
SM-S705
MU-S705

SW-S705
ST-S705-R
BL-S705-L
SC-S705

SM-BTR1
SM-BMR1 (Ver.2.0.0 ~)
SM-BMR2
SM-JC40
EW-SD50
SM-EWC2
SM-BCR1
SM-BCC1

SM-BTR2
SM-BCR2
SM-JC41
EW-SD50-I

CONTENTS

IMPORTANT NOTICE

- **This dealer's manual is intended primarily for use by professional bicycle mechanics.**
  Users who are not professionally trained for bicycle assembly should not attempt to install the components themselves using the dealer's manuals.
  If any part of the information on the manual is unclear to you, do not proceed with the installation. Instead, contact your place of purchase or a local bicycle dealer for their assistance.
- Make sure to read all instruction manuals included with the product.
- Do not disassemble or modify the product other than as stated in the information contained in this dealer's manual.
- All dealer's manuals and instruction manuals can be viewed on-line on our website (**http://si.shimano.com**).
- Please observe the appropriate rules and regulations of the country, state or region in which you conduct your business as a dealer.

For safety, be sure to read this dealer's manual thoroughly before use, and follow it for correct use.

The following instructions must be observed at all times in order to prevent personal injury and physical damage to equipment and surroundings.
The instructions are classified according to the degree of danger or damage which may occur if the product is used incorrectly.

⚠ DANGER

Failure to follow the instructions will result in death or serious injury.

⚠ WARNING

Failure to follow the instructions could result in death or serious injury.

⚠ CAUTION

Failure to follow the instructions could cause personal injury or physical damage to equipment and surroundings.

TO ENSURE SAFETY

⚠ DANGER

Be sure to also inform users of the following:

Be sure to observe the following in order to avoid burns or other injury from fluid leakages, overheating, fire or explosions.

< Lithium ion battery >

- Use the dedicated charger to charge the battery. If any non-specified items are used, fire, overheating or leakages may occur.
- Do not heat the battery or throw it into fire. If this is not observed, fire or bursting may occur.
- Do not disassemble or modify the battery or apply solder directly to the battery terminals. Do not leave the battery in places which may exceed 60 °C in temperature, such as places which are exposed to direct sunlight inside vehicles on hot days or near stoves. If this is not observed, leakages, overheating or bursting may cause fire, burns or other injury to occur.
- Do not connect the (+) and (-) terminals with metallic objects. Do not carry or store the battery together with metallic objects such as necklaces or hairpins. If this is not observed, short-circuits, overheating, burns or other injury may occur.
- If any liquid leaking from the battery gets into the eyes, immediately wash the affected area with clean water without rubbing the eyes, and then seek medical advice. If this is not done, blindness may occur.

< Battery charger / Battery charger cord >

- Do not get the charger wet or use it while it is wet, and do not touch or hold it with wet hands. If this is not observed, problems with operation or electric shocks may occur.
- Do not cover the charger with a cloth or similar while it is in use. If this is not observed, heat may build up and the case may become deformed, or fire or overheating may occur.
- Do not disassemble or modify the charger. If this is not observed, electric shocks or injury may occur.
- Use the charger at the specified power supply voltage only. If a power supply voltage other than that specified is used, fire, explosions, smoke, overheating, electric shocks or burns may occur.
- Do not touch metallic parts of the charger or the AC adapter if there is a lighting storm. If lightning strikes, electric shocks may occur.

< SM-BCR2: Battery charger for SM-BTR2 / SM-BTR2: Lithium ion battery (built-in type) >

- Use an AC adapter with a USB port with a voltage of 5.0 Vdc and with a current equal to or higher than 1.0 Adc. If the one with a current lower than 1.0 A is used, the AC adapter may heat up, potentially causing a fire, smoke, overheating, destruction, electric shock, or burns.

⚠ WARNING

- **When installing components, be sure to follow the instructions that are given in the instruction manuals.**
  It is recommended that you use only genuine Shimano parts. If parts such as bolts and nuts become loose or damaged, the bicycle may suddenly fall over, which may cause serious injury.
  In addition, if adjustments are not carried out correctly, problems may occur, and the bicycle may suddenly fall over, which may cause serious injury.
-  Be sure to wear safety glasses or goggles to protect your eyes while performing maintenance tasks such as replacing parts.
- After reading the dealer's manual thoroughly, keep it in a safe place for later reference.

Be sure to also inform users of the following:

- ***Maintenance interval depends on the usage and riding circumstances. Clean regularly the chain with an appropriate chain cleaner. Never use alkali based or acid based solvents such as rust cleaners. If those solvent be used chain might break and cause serious injury.***
- Check that the wheels are fastened securely before riding the bicycle. If the wheels are loose in any way, they may come off the bicycle and serious injury may result.
- Check the chain for any damage (deformation or crack), skipping, or other abnormalities such as unintended gear shifting. If any problems are found, consult a dealer or an agency. The chain may break, and you may fall.

< Lithium ion battery >

- Do not place the battery into fresh water or sea water, and do not allow the battery terminals to get wet. If this is not observed, fire, bursting or overheating may occur.
- Do not use the battery if it has any noticeable scratching or other external damage. If this is not observed, bursting, overheating or problems with operation may occur.
- Do not subject the battery to strong shocks or throw it. If this is not observed, bursting, overheating or problems with operation may occur.
- Do not use the battery if leakages, discoloration, deformation or any other abnormalities occur. If this is not observed, bursting, overheating or problems with operation may occur.
- If any leaked fluid gets on your skin or clothes, wash it off immediately with clean water. The leaked fluid may damage the skin.

< SM-BTR1: Lithium ion battery (external type) >

- If charging is not complete after 1.5 hours of charging time has elapsed, stop the charging. If this is not observed, fire, bursting or overheating may occur.
- The operating temperature ranges for the battery are given below. Do not use the battery in temperatures outside these ranges. If the battery is used or stored in temperatures which are outside these ranges, fire, injury or problems with operation may occur.
  1. During discharge: –10 °C - 50 °C
  2. During charging: 0 °C - 45 °C

< SM-BTR2: Lithium ion battery (built-in type) >

- If the battery does not become fully charged after 4 hours of charging, stop charging.
- The operating temperature ranges for the battery are given below. Do not use the battery in temperatures outside these ranges. If the battery is used or stored in temperatures which are outside these ranges, fire, injury or problems with operation may occur.
  1. During discharge: –10 °C - 50 °C
  2. During charging: 0 °C - 45 °C

< Battery charger / Battery charger cord >

- Be sure to hold the power cable by the power plug when connecting and disconnecting the power plug from the electrical outlet. If you do not hold the power cable by the power plug, fire or electric shocks may occur.
  * If heat or acrid-smelling smoke is coming out from the power plug.
  * There may be a bad connection inside the power plug.
- Do not overload the electrical outlet with appliances beyond its rated capacity, and use only a 100 – 240 V AC electrical outlet. If the electrical outlet is overloaded by connecting too many appliances using adapters, overheating resulting in fire may occur.
- Do not damage the power cord or power plug. (Do not damage, process, forcibly bend, twist or pull them, bring them near hot objects, place heavy objects on them or bundle them tightly together.) If they are used while damaged, fire, electric shocks or short-circuits may occur.
- Do not use the charger with commercially-available electrical transformers designed for overseas use, as they may damage the charger.
- Always be sure to insert the power plug as far as it will go. If this is not observed, fire may occur.

< SM-BCR2: Battery charger for SM-BTR2 >

- Do not use any USB cable other than the USB cable which is supplied with the PC linkage device. This may cause a charge error, fire, or failure of the connected PC due to heating.
- Do not connect the charger to PC when it is on standby. This may cause a failure of PC depending on its specifications.
- When connecting or disconnecting the USB cable or the charging cable, be sure to hold the plug of the cable. Failure to do so may cause a fire or electric shock.
  If the following symptoms are observed, stop using the device and contact a dealer. A fire or electric shock may be caused.
  * If heat or acrid-smelling smoke is coming out from the power plug.
  * There may be a bad connection inside the power plug.
- If it thunders while charging with an AC adapter with a USB port, do not touch the device, bicycle, or the AC adapter. When lightning strikes, an electric shock may be caused.
- Use an AC adapter with a USB port with a voltage of 5.0 Vdc and with a current equal to or higher than 1.0 Adc. If the one with a current lower than 1.0 Adc is used, a charge error may occur or the AC adapter may heat up, leading to a fire.
- Do not use a USB hub when connecting the cable to a PC USB port. This may cause a charge error or fire due to heating.
- Be careful not to damage the charging cable. (Do not damage, process, forcibly bend, twist or pull them, bring them near hot objects, place heavy objects on them or bundle them tightly together.) If they are used while damaged, fire, electric shocks or short-circuits may occur.

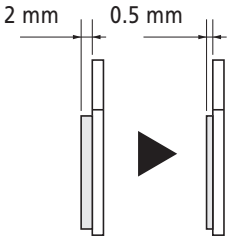
< Brake >

- It is important to completely understand the operation of your bicycle's brake system. Improper use of your bicycle's brake system may result in a loss of control or a fall, which could lead to severe injury. Because each bicycle may handle differently, be sure to learn the proper braking technique (including brake lever pressure and bicycle control characteristics) and operation of your bicycle. This can be done by consulting your professional bicycle dealer and the bicycle's owners manual, and by practicing your riding and braking technique.
- If the front brake is applied too strongly, the wheel may lock and the bicycle may fall forward, and serious injury may result.
- Always make sure that the front and rear brakes are working correctly before you ride the bicycle.
- The required braking distance will be longer during wet weather. Reduce your speed and apply the brakes early and gently.
- If the road surface is wet, the tires will skid more easily. If the tires skid, you may fall off the bicycle. To avoid this, reduce your speed and apply the brakes early and gently.

< Disc brake >

- Please use extra caution to keep your fingers away from the rotating disc brake rotor. The disc brake rotor is sharp enough to inflict severe injury to your fingers if caught within the openings of moving rotor.

- The calipers and disc brake rotor will become hot when the brakes are operated, so do not touch them while riding or immediately after dismounting from the bicycle, otherwise you may get burned.
- Be careful not to allow any oil or grease to get onto the disc brake rotor and brake pads, otherwise the brakes may not work correctly.
- If any oil or grease does get on the pads, you should consult a dealer or an agency. There is the danger that the brakes may not work correctly.
- If noise occurs during brake operation, the pads may have been worn down to the usable limit. Check that the brake system temperature has been cooled down sufficiently, and then check that the thickness of each pad is 0.5 mm or more. Or, consult a dealer or an agency.



- If the disc brake rotor is cracked or deformed, immediately stop using the brakes and consult a dealer or an agency.
- If the disc brake rotor becomes worn down to a thickness of 1.5 mm or less, or if the aluminum surface appears, immediately stop using the brakes and consult a dealer or an agency. The disc brake rotor may break, and you may fall off the bicycle.

For Installation to the Bicycle, and Maintenance:

- When installing the hub to the frame, install the specified non-turn washer to both the left and right sides, and securely tighten the hub nut to the specified torque. If the non-turn washer is installed only on one side or the hub nut is not fully tightened, the non-turn washer may come off, causing the hub axle and the motor unit to turn, which in turn may cause the electric wire to be disconnected or damage the motor unit.
- Assemble the wheel with 3x or 4x spoke lacing. Do not spoke the wheel radially. Otherwise, the spokes or the wheel may be damaged, or noise may occur when braking.

< SG-S705 >

- For SG-S705, be sure to insert a rotor spacer when installing the disc brake rotor. Otherwise, the disc brake rotor may rattle, causing noise or braking failure.

⚠ CAUTION

Be sure to also inform users of the following:

< SM-BCR1: Battery charger for SM-BTR1 >

- Disconnect the power plug from the electrical outlet before cleaning the charger.

< SM-BCR2: Battery charger for SM-BTR2 >

- Disconnect the USB cable or the charging cable when performing maintenance.

< Lithium Ion Battery >

- Store the battery in a safe place away from the reach of infants and pets.

< SM-BTR1: Lithium ion battery (external type) >

- If not using the battery for long periods, remove it and store it away in a safe place.

< SM-BTR2: Lithium ion battery (built-in type) >

- If the unit will not be used for an extended period, store it after charging in cool indoor places (approx. 10 to 20 °C) where the battery will not be exposed to direct sunlight or rain.

< Disc brake >

- Disc brakes have a burn-in period, and the braking force will gradually increase as the burn-in period progresses. Make sure that you are aware of any such increases in braking force when using the brakes during the burn-in period. The same thing will happen when the brake pads or disc brake rotor are replaced.

NOTE

Be sure to also inform users of the following:

- Be sure to rotate the crank when carrying out any switch operations which are related to gear shifting.
- This is a small waterproof connector. Do not repeat connecting and disconnecting it. It may impair the function.
- Be careful not to let water get into the terminal.
- The components are designed to be fully waterproofed to withstand wet weather riding conditions; however, do not deliberately place them into water.
- Do not clean the bicycle in a high-pressure car wash. If water gets into any of the components, operating problems or rusting may result.
- Handle the products carefully, and avoid subjecting them to any strong shocks.
- Do not use thinners or similar substances to clean the products. Such substances may damage the surfaces.
- Contact the place of purchase for updates of the product software. The most up-to-date information is available on the Shimano website.
- Products are not guaranteed against natural wear and deterioration from normal use and aging.
- For maximum performance we highly recommend Shimano lubricants and maintenance products.

< SG-S705 / SG-S505 >

- The internal geared hub is not completely waterproof. Avoid using the hub in places where water might get inside it and do not use high-pressure water to clean the hub, otherwise the internal mechanism may rust.
- You can shift gears while pedaling, but on rare occasions the pawls and ratchet inside the hub may produce some noise afterwards as part of normal gear shifting operation.
- The internal geared hub has a built-in mechanism to support shifting. When this support mechanism operates during shifting, noise or vibration may occur. The shifting feel may also change depending on the gear position at the time of shifting.
  Noise may also be produced in the 5 to 8th gear for SG-S505 and 7 to 11th gear for SG-S705 if the crank arms are turned backward or if the bicycle is pushed backward.
  These occurrences are a normal result of the structure of the internal gear shifting mechanism, and are not a sign of a malfunction.

< Battery charger / Battery charger cord >

- Use this instrument under the direction of a safety supervisor or the direction for use. Do not allow physically, sensory, or mentally impaired persons, inexperienced persons, or persons with no required knowledge including children to use this instrument.
- Do not allow children to play near this instrument.

Disposal information for countries outside the European Union

This symbol is only valid within the European Union.
Contact the place of purchase or your nearest Shimano agent for advice on disposing.

< Lithium ion battery >

- Lithium ion batteries are recyclable, valuable resources.
  For information on used batteries, contact the place of purchase or a bicycle dealer.
- Charging can be carried out at any time regardless of the amount of charge remaining. Always be sure to use the special battery charger to charge the battery until it is fully recharged.
- The battery is uncharged at the time of purchase. Before riding, be sure to charge the battery until it is fully charged.
- If the battery has become fully spent, charge it as soon as possible. If you leave the battery without charging it, it will cause the battery to deteriorate.
- The battery is a consumable item. The battery will gradually lose its capacity for charging after repeated use and after time has passed. If the length of time that the battery can be used becomes extremely short, it has probably reached the end of its life, and so you will need to purchase a new battery.
- The life of the battery will vary depending on factors such as the storage method, the usage conditions, the surrounding environment and the characteristics of the individual battery pack.
- If storing the battery away for a long period, remove it when the battery level is 50% or higher or when the green indicator is illuminating in order to prolong its useful life. It is recommended that you charge the battery about once every half a year.
- If the storage temperature is high, the performance of the battery is reduced, and its available time will be shorter. When you use the battery after a long storage period, store the battery indoors where the battery will not be exposed to direct sunlight or rain.
- If the ambient temperature is low, the available time of the battery will be shorter.

< SM-BTR1: Lithium ion battery (external type) >

- When storing the battery away, remove the battery from the bicycle and install the terminal cover first.
- The charging time is approximately 1.5 hours. (Note that the actual time will vary depending on the amount of charge remaining in the battery.)
- If the battery feels difficult to insert or remove, apply specified grease (premium grease) to the part that touches the O-ring at the side.

< SM-BTR2: Lithium ion battery (built-in type) >

- After removing the battery from the bicycle for storage, install a dummy plug.
- The charging time of an AC adapter with a USB port is about 1.5 hours, and that of computer USB port type about 3 hours. (Note that the actual time will vary depending on the amount of charge remaining in the battery. Depending on the specifications of the AC adapter, recharging via the AC adapter requires as many hours (about 3 hours) as recharging via PC.)

< Battery charger / Battery charger cord>

- Charge the battery in indoor places to avoid exposure to rain or wind.
- Do not use outdoors or in environments with high humidity.
- Do not place the PC linkage device on dusty floors when using it.
- Place the PC linkage device on a stable surface such as a table when using it.
- Do not place any objects on top of the PC linkage device or its cables.
- Do not wrap the cables into bundles.
- Do not hold the PC linkage device by the cables when carrying it.
- Do not apply excessive tension to the cables.
- Do not wash the PC linkage device or wipe it using detergents.
- Use this instrument under the direction of a safety supervisor or the direction for use. Do not allow physically, sensory, or mentally impaired persons, inexperienced persons, or persons with no required knowledge including children to use this instrument.
- Do not allow children to play near this instrument.

< SM-BCR2 : Battery charger for SM-BTR2 >

- Connect the PC linkage device directly to a computer, without using an intermediate device such as a USB hub.
- Do not ride the bicycle while the PC linkage device and cable are still connected to it.
- Do not connect two or more of the same units to the same connection point. If this is not done, the units may not operate correctly.
- Do not connect or disconnect units again while unit recognition is in progress or after recognition is complete. If this is not done, the units may not operate correctly.
  Check the procedures which are given in the user's manual for the E-tube Project when connecting and disconnecting units.
- The tightness of the PC link cable will tend to drop after repeated connections and disconnections. If this happens, replace the cable.
- Do not connect two or more PC linkage device at the same time. If two or more PC linkage device units are connected, they will not operate correctly. In addition, operating errors may occur at the PC and it may require the PC to be restarted.
- PC linkage devices cannot be used while the charger is connected.

For Installation to the Bicycle, and Maintenance:

- Be sure to attach dummy plugs to any unused terminals.
- Always be sure to use the TL-EW02 special tool to remove the electric wires.
- The motor unit cannot be disassembled for repair.
- Contact Shimano for information regarding the shipment of the battery charger to South Korea and Malaysia.
- You should periodically wash the chainrings in a neutral detergent. In addition, cleaning the chain with neutral detergent and lubricating it can be an effective way of extending the useful life of the chainrings and the chain.
- If chain skipping has started occurring, replace the gears and the chain at a dealer or an agency.

< Internal geared hub >

- The sprocket should be used from 18T to 23T.

	Sprocket
Tensioner use	18, 20
w/o Tensioner use	18, 19, 20, 21, 22, 23

- It is recommended that the chainring of the front be set to a gear ratio of 2 to 2.25 for SG-S505 and 1.8 to 2.0 for SG-S705.

Example)

	Gear ratio	Front	Rear
11-speed	1.8-2.0	45T	23T
		39T	20T
8-speed	2-2.25	45T	20T
		39T	18T

- In order to maintain proper performance, it is recommended that you contact the place of purchase or a bicycle dealer to carry out maintenance such as internal oil replacement after riding 1,000 km from the start of use and after that, about once every two years (or once about every 5,000 km if the bicycle is used very frequently).

< SG-S705 >

- When you perform oil maintenance, use the SG-S700 OIL or TL-S703 maintenance kit.
  When you replace the oil, follow the manual for TL-S703. When you replace the seal on the right side, use TL-S704.
  If SG-S700 OIL is not used, problems such as an oil leakage and gear shifting malfunction may occur.

< SG-S505 >

- When you perform oil maintenance, use the WB maintenance oil or the WB maintenance oil set.
  If the WB maintenance oil is not used, problems such as an oil leakage and gear shifting malfunction may occur.

< Electric wires / Electric wire covers >

- Secure the electric wires with zip ties so that they do not interfere with the chainrings, sprockets and tires.
- The strength of the adhesive is fairly weak, to prevent the paint on the frame from being peeled off at the same time when removing the electric wire cover for reasons such as replacing the electric wires. If the electric wire cover is peeled off, replace it with a new one. When removing the electric wire cover, do not peel it off too vigorously. If this is not observed, the paint on the frame will peel off too.
- Do not remove the wire holders which are attached to the built-in type electric wires (EW-SD50-I). The wire holders prevent the electric wires from moving inside the frame.

< Dual control lever >

- Dummy plugs are installed at the time of shipment from the factory. Do not remove them except when necessary.
- When routing the electric wires, take care to ensure that they do not interfere with the brake levers.

< SM-BMR1 / Battery mount >

- This is supported by the firmware versions 2.0.0 and later.

The actual product may differ from the illustration because this manual is intended chiefly to explain the procedures for using the product.

For Installation to the Bicycle, and Maintenance:

< Notes when reinstalling and replacing components >

- When the product is reassembled or replaced, it is automatically recognized by the system to allow operation according to the settings.
- If the system does not operate after reassembly and replacement, follow the system power reset procedure above to check the operation.
- If the component configuration changes or malfunction is observed, use the E-tube Project software to update the firmware of each component to the latest version and perform a check again. Also make sure that the E-tube Project software is the latest version. If the software is not the latest version, the component compatibility or the product functions may not be sufficiently available.

Be sure to also inform users of the following:

< About used batteries >

- Lithium ion batteries are recyclable, valuable resources.
  For information on used batteries, contact the place of purchase or a bicycle dealer.

< About system power reset >

- When the system fails to operate, the system may be recovered by resetting the system power.
- After the battery is removed, about one minute is usually required for the system power to reset.

< SM-BTR1 >

- Remove the battery from the battery mount. After about one minute, install the battery.

< SM-BTR2 >

- Disconnect the plug from SM-BTR2. After about one minute, insert the plug.

< Connection and communication with the computer >

The PC linkage device can be used to connect a PC to the bicycle (system or component), and an E-tube Project can be used to carry out tasks such as updating firmware of single component and system, and customizing.

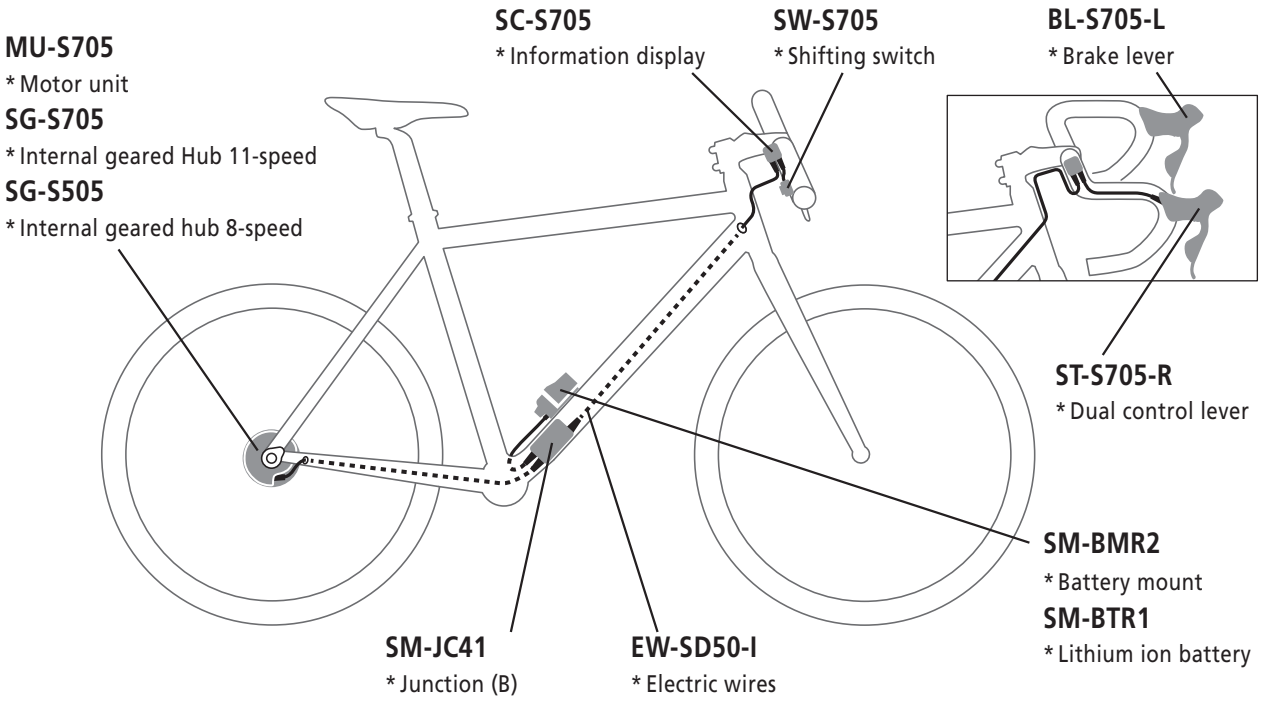
- PC Linkage Device: SM-PCE1/SM-BCR2
- E-tube Project: the PC application
- Firmware: the software inside each component

INSTALLATION

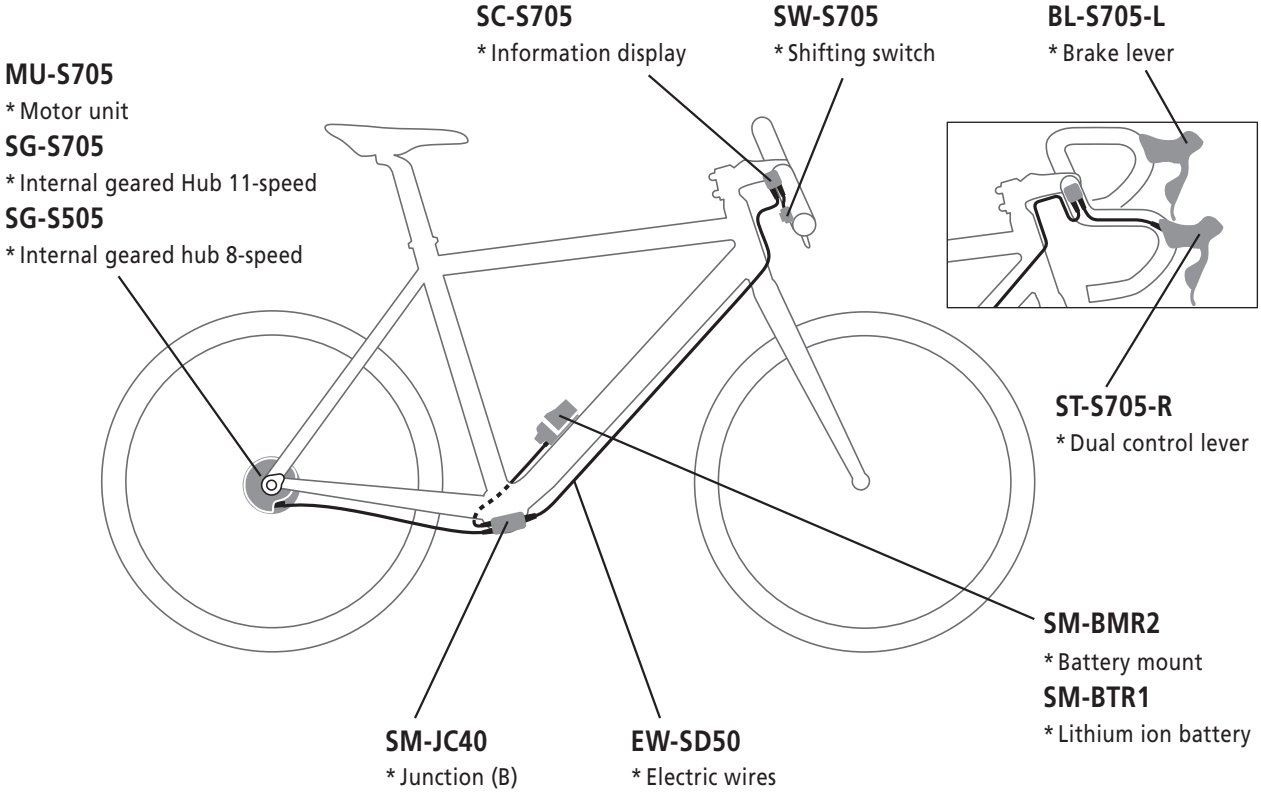
■ Names and example locations of each part

Lithium ion battery (external type) SM-BTR1

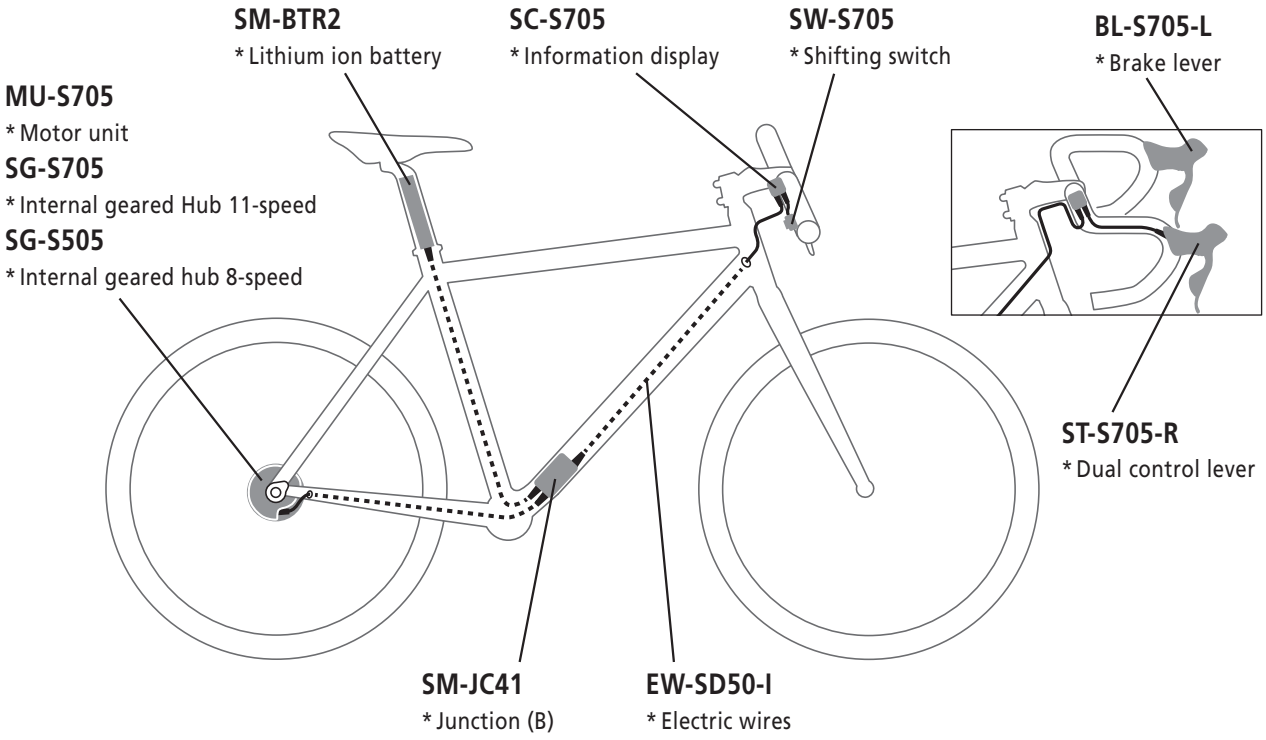
< SM-JC41 >



< SM-JC40 >



Lithium ion battery (built-in type) SM-BTR2



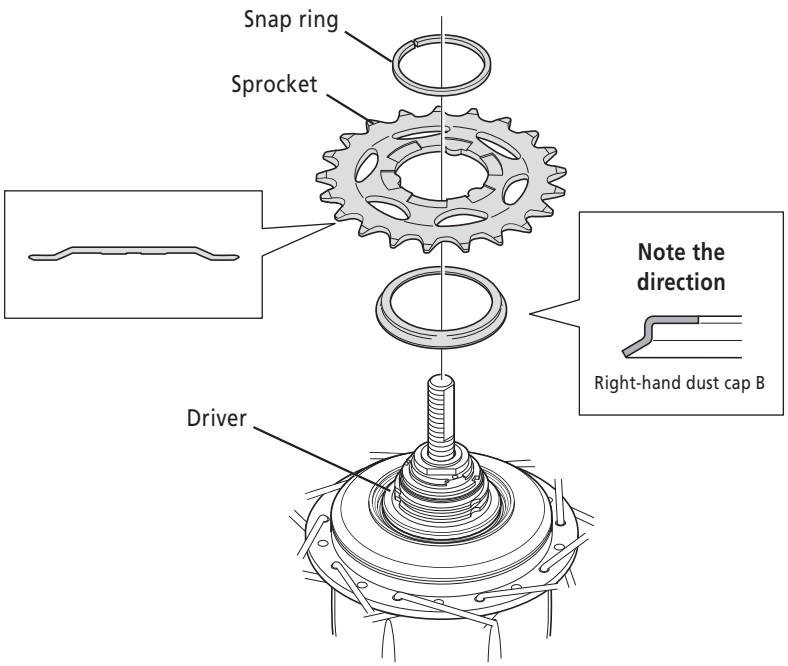
List of tools to be used

The following tools are required to assemble the product.

Where to use	Tool
Motor unit	TL-SGE1 (Tools for mounting motor unit to the hub)
Internal geared hub (Hub nut)	17 mm wrench
Brake lever	5 mm Allen key
Dual control lever	5 mm Allen key
Shifting switch	4 mm Allen key
Battery mount	2 mm Allen key
Snap ring (Lithium ion battery (built-in type))	Snap ring pliers
Electric wires	TL-EW02

■ Installation of the sprocket to the hub (SG-S705 / 505 / SM-S705)

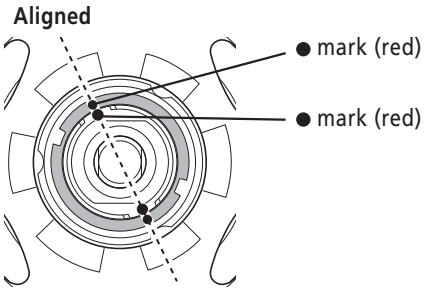
Place right-hand dust cap B onto the driver on the right side of the hub body.
Next, install the sprocket and secure it in place with the snap ring.



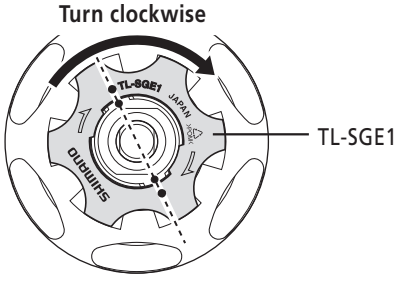
Note:
This product should only be used with inward assembling sprockets from 16T to 23T.

■ Installation of the motor unit to the hub (MU-S705)

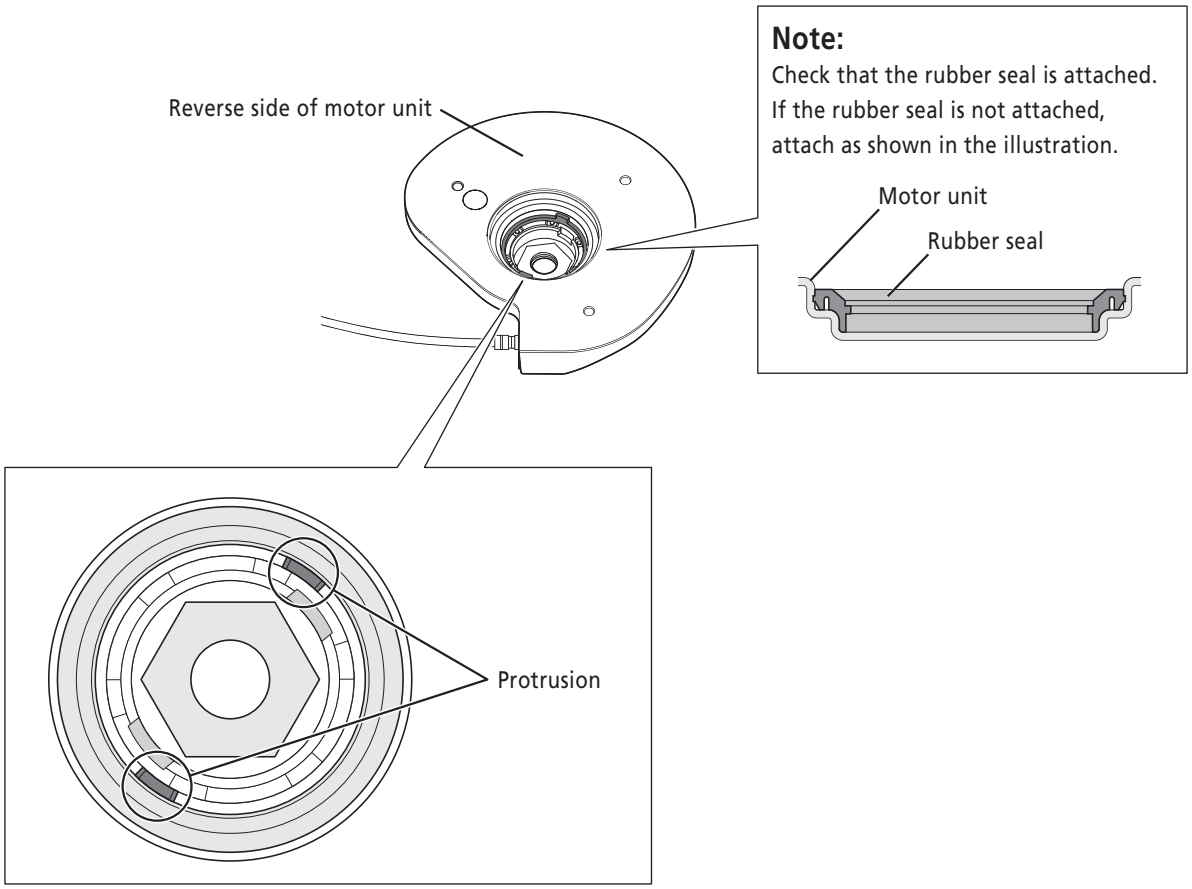
1. Check that the two ● marks (red) on the right side of the hub body are aligned.



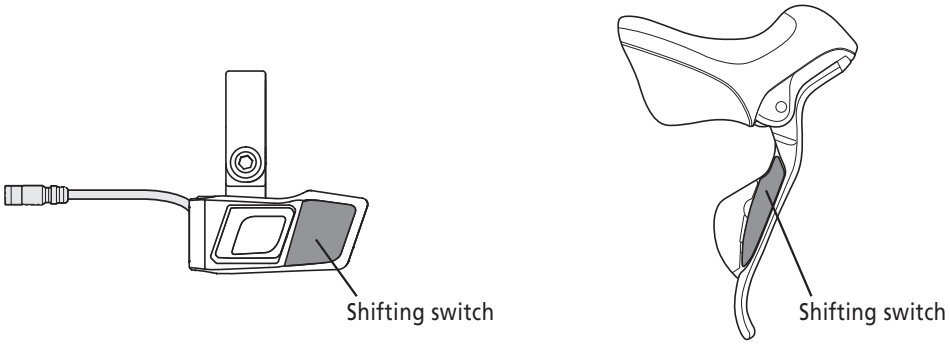
If the two ● marks (red) are not aligned, use the TL-SGE1 to align the two ● marks (red).



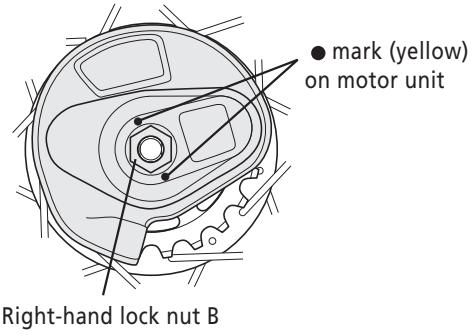
2. Make sure that the two protrusions on the back side of the motor unit are at the initial positions as shown in the following illustration.

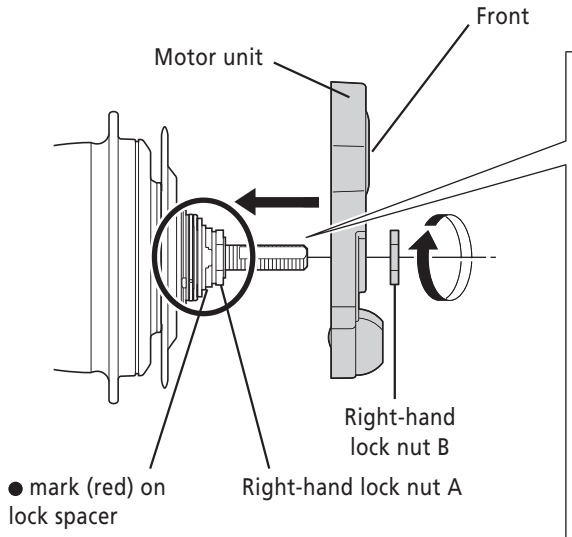


The motor unit is set at the initial position when it is shipped. Install it without changing the position. If the motor unit may not be at the initial position, push the following shifting switch ten or more times to move the protrusions on the motor unit clockwise (check from the back side of the motor unit). (Check the shifting up and down of the shifting switch in advance as it may have been switched by customization.) If the motor unit is installed off the initial position, some gears may become unavailable and the hub or the motor unit may be damaged.



3. Install the motor unit to the hub so that the ● mark (yellow) on the motor unit is aligned with the ● mark (red) on the hub lock spacer. After this, gently push the motor unit while turning it slowly to set it correctly until it stops turning on the hub axle. Next, secure the motor unit by tightening right-hand lock nut B.

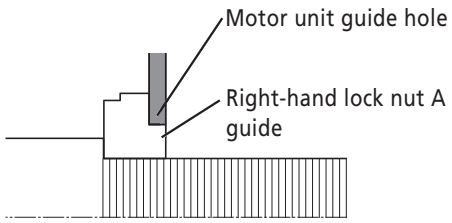




Tightening torque:
6.0 - 10.0 N·m {52 - 87 in. lbs.}

Note:

Check that the guide of right-hand lock nut A is seated securely in the guide hole on the front of the motor unit.

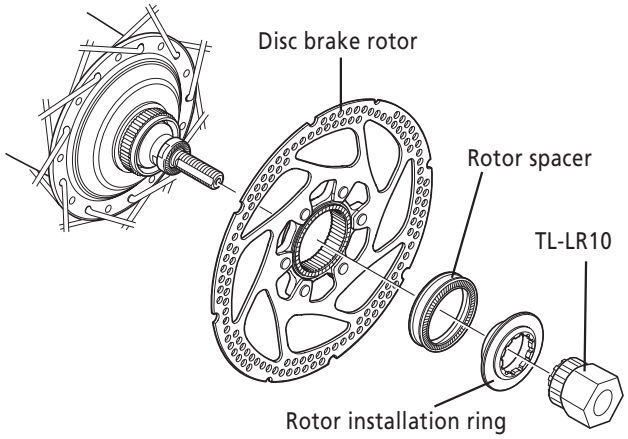


If the tab is out of position, connect the shifting lever, electric wire, information display, and battery unit to the motor unit before manually shifting gears to 1st.

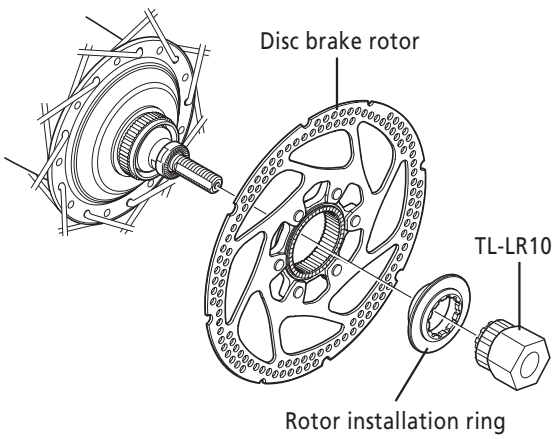
■ Installation of the disc brake rotor

Install the disc brake rotor as shown in the illustration.

< SG-S705 >



< SG-S505 >



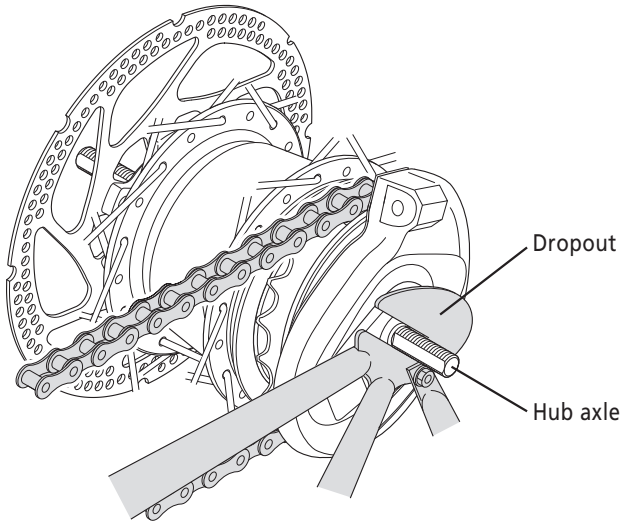
Tightening torque:
40.0 N·m {350 in. lbs.}

■ Installation of the hub to the frame

* The method of installing the hub to the frame is the same when the chain tensioner is being used and when it is not being used.

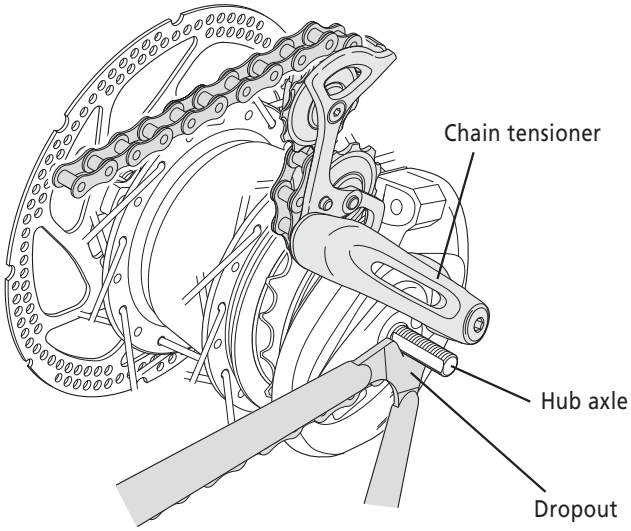
1. Mount the chain on the sprocket, and then set the hub axle into the dropouts.

< When not using the chain tensioner >

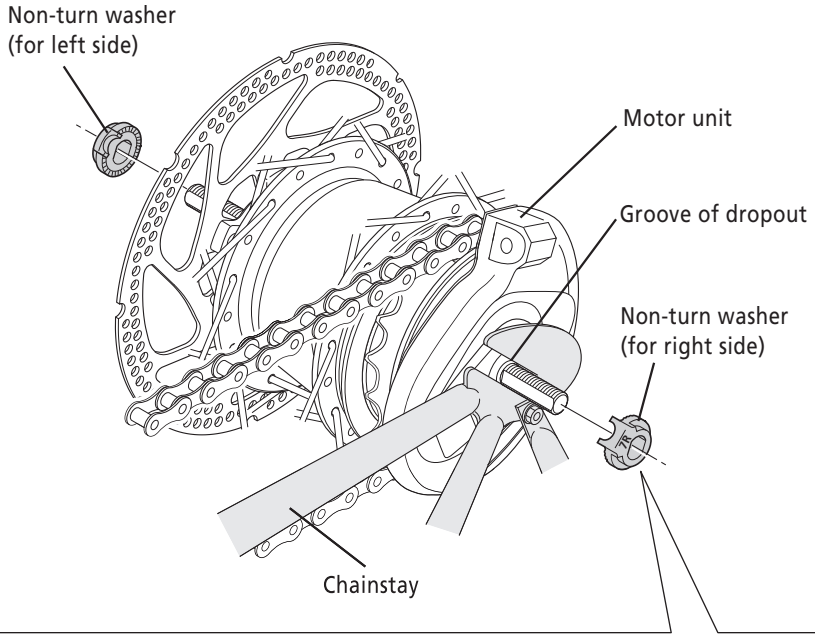


< When using the chain tensioner >

When using the chain tensioner, be sure to read these service instructions in conjunction with the service instructions for the CT-S500 chain tensioner.

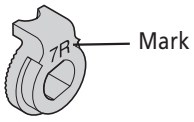


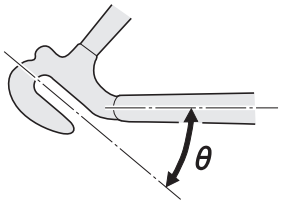
2. Place the non-turn washers onto the right side and left side of the hub axle. At this time, turn the motor unit so that the projecting parts of the non-turn washers fit into the grooves of the dropouts. If this is done, the motor unit can be installed so that it is almost parallel to the chainstay.



- Use whichever non-turn washers match the shape of the dropouts. Different non-turn washers are used at the left and right sides.

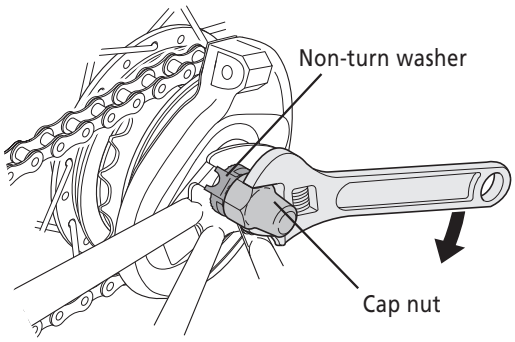
Dropouts	Non-turn washer		
	Mark / Color		Size
	Right	Left	
Standard	5R / Yellow	5L / Brown	θ ≤ 20°
	7R / Black	7L / Gray	θ ≤ 38°
Reversed	6R / Silver	6L / White	θ = 0°
Reversed (full chain case)	5R / Yellow	5L / Brown	θ = 0°
Vertical	8R / Blue	8L / Green	θ = 60° - 90°





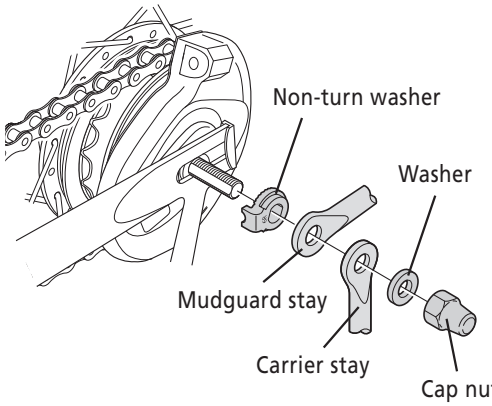
- The projecting parts should be on the dropouts side.
- Install the non-turn washers so that the projecting parts is securely in the dropouts grooves on either side of the hub axle.

3. Take up the slack in the chain and secure the wheel to the frame with the cap nuts.

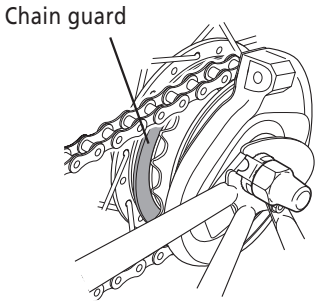


Tightening torque:
30.0 - 45.0 N·m {262 - 393 in. lbs.}

Note:
When installing a part such as a mudguard stay to the hub axle, install in the order shown in the illustration below.

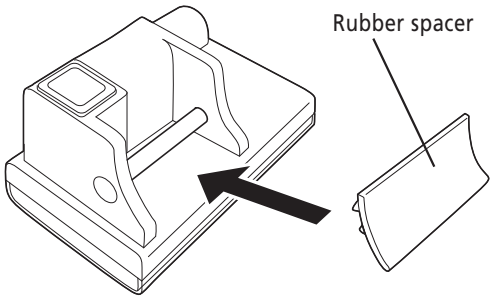


Note:
When installing the hub to the frame, the chain guard may come off, so check that the chain guard is securely installed so that it will not come off.
If it is not fully installed, noise may be generated.



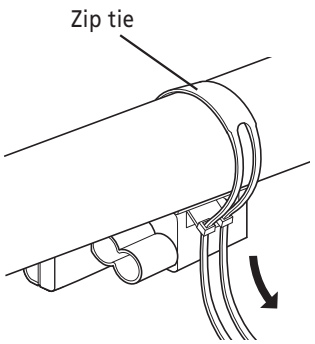
■ Installation of the information display (SC-S705)

1. Install the rubber spacer to the Information display.



2. Attach to the handle with the included zip tie.
Manually tighten the zip tie completely.

- Use a handle with a diameter of 25.6 to 31.8.

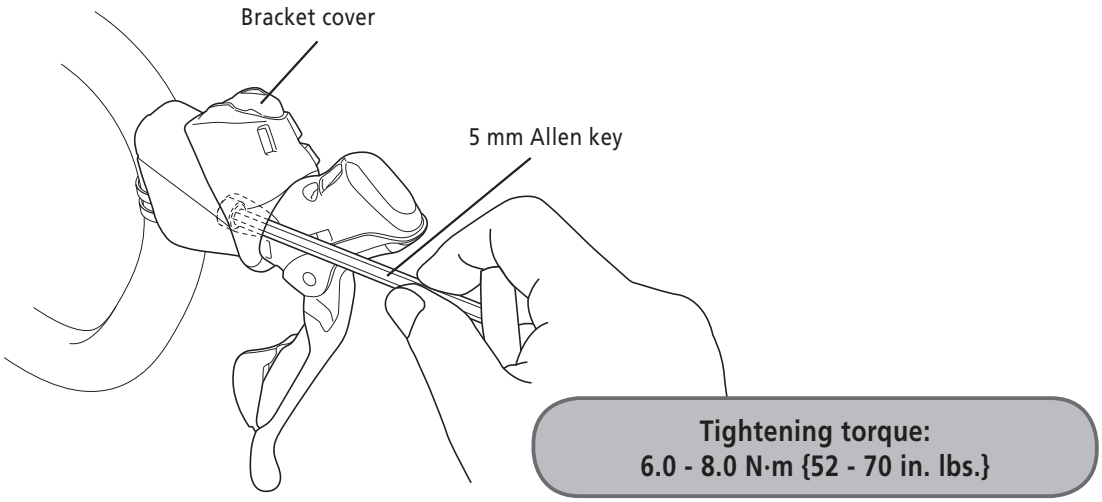


■ Installation of the shifting lever and brake lever

In the case of a drop handlebar (ST-S705-R / BL-S705)

Installation of the dual control lever

Open up the bracket cover from the front, and then use a 5 mm Allen key to tighten the clamp bolt in order to secure the lever unit.



When installing the components to carbon frame/handlebar surfaces, verify with the manufacturer of the carbon frame/parts for their recommendation on tightening torque in order to prevent over tightening that can cause damage to the carbon material and/or under tightening that can cause lack of fixing strength for the components.

Installation of the brake cables

Cables used

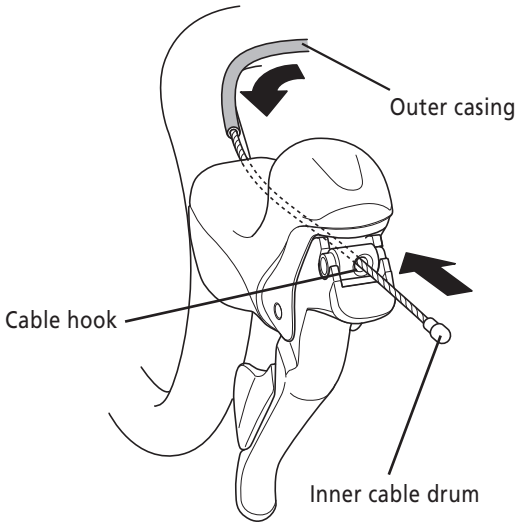
Inner cable ... ϕ1.6 mm

SLR outer casing ... ϕ5 mm

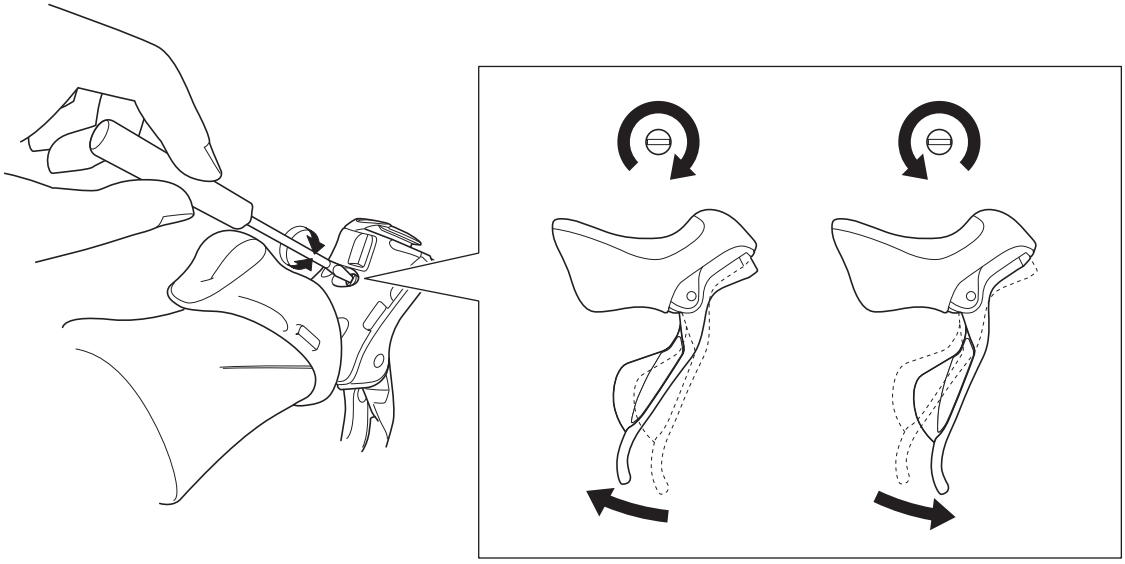
Use cables which are long enough so that they still have some slack even when the handlebars are turned as far as they will go to the left and to the right.

1. Gently pull the brake lever.

2. Pass the inner cable through from directly in front, set the inner cable drum into the cable hook, and then install the outer casing from the opposite side.



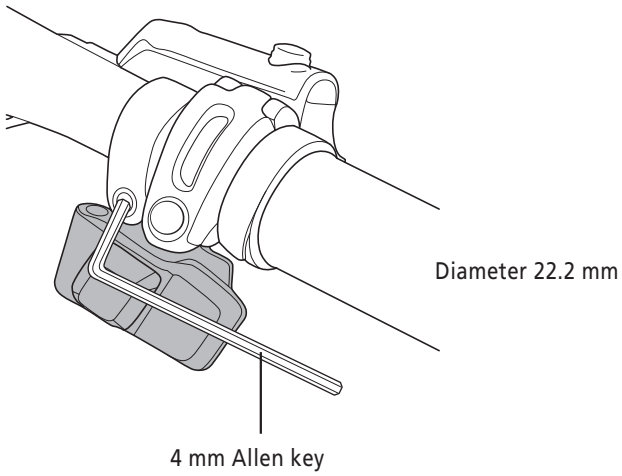
The lever stroke can be smoothly adjusted using the bolt on the top of the bracket unit. Check the lever operation while adjusting.



In the case of a flat handlebar (SW-S705)

Installation of the shifting switch

Install the shifting switch as shown in the illustration.



Tightening torque:
5.0 - 7.0 N·m {44 - 61 in. lbs.}

- Use a handlebar grip with a maximum outer diameter of 32 mm.

■ Installation of the battery

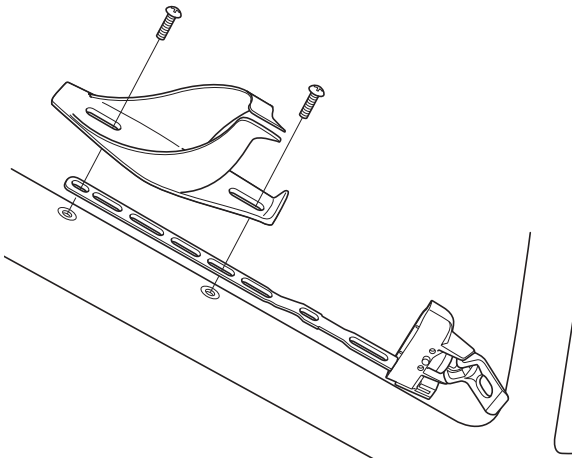
In the case of an external battery

Installation of the battery mount

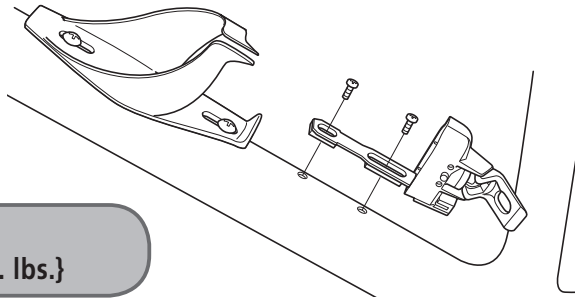
* Both SM-BMR1 and 2 can be installed using the same procedure. The down tube (under the bottle cage) is used for explanation here, but the mounting location is not limited to this section.

1. Set the battery mount into position. Use the bottle cage fixing bolt to provisionally install the battery mount to the bottom of the bottle cage.

Use the bolts which are included with the bottle cage to secure the long type.
Refer to the Service Instructions for the bottle cage for details on the tightening torques.

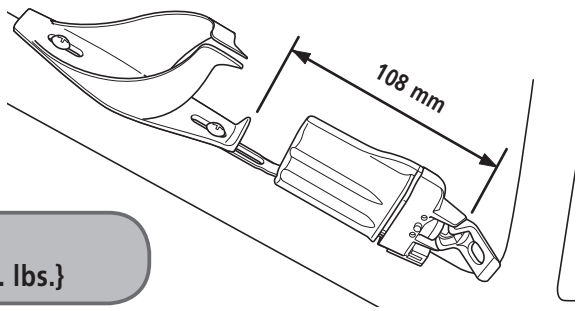


Use the included M4 bolts to secure the short type.



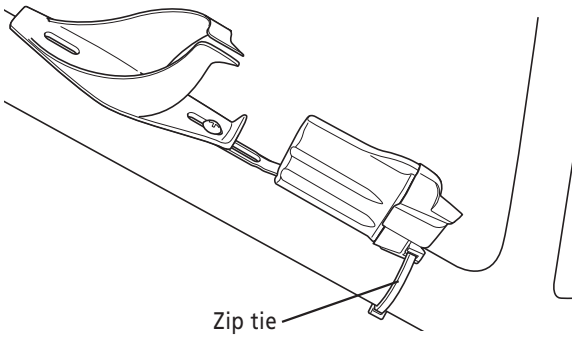
Tightening torque:
1.2 - 1.5 N·m {10.5 - 13.1 in. lbs.}

2. Leave a space of 108 mm or more at the end of the battery mount. Check that the battery can be inserted and removed while the bottle cage is installed.

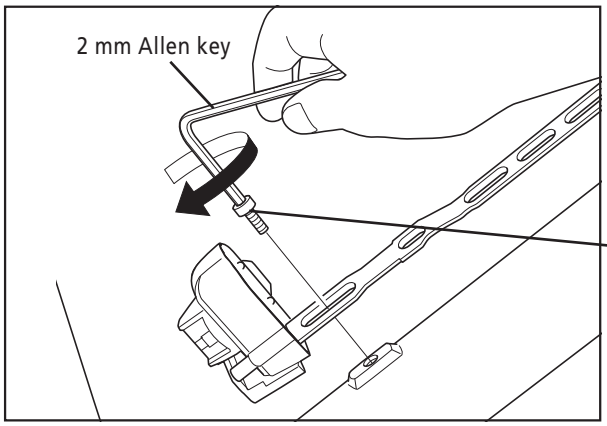


Tightening torque:
1.2 - 1.5 N·m {10.5 - 13.1 in. lbs.}

3. Tighten the bolt of the bottle cage to secure the battery mount. For the long type, use the accessory zip tie to secure the battery mount to the frame.



* If there is a mounting boss on the frame, the battery mount can be secured to the frame with a bolt.



Tightening torque:
1.2 - 1.5 N·m {10.5 - 13.1 in. lbs.}

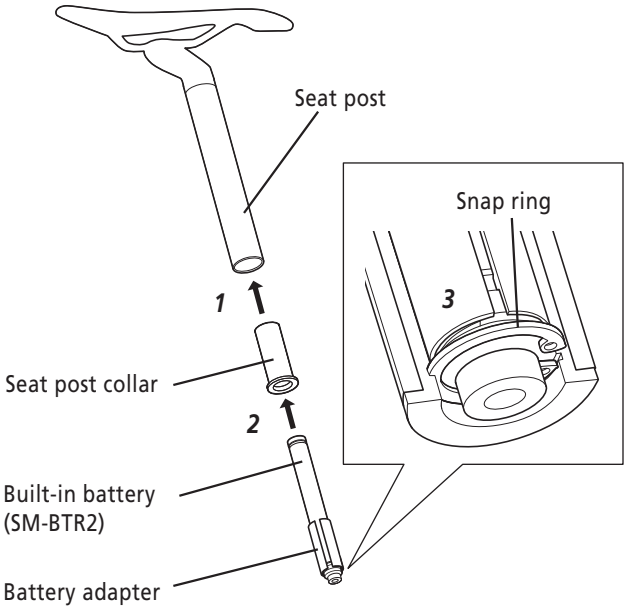
In the case of a built-in battery

Installation of the battery

1. Bond seat post collar to inside of seat post.

2. Insert built-in battery into the collar from the bottom of seat post.

3. Fix the battery with snap ring.

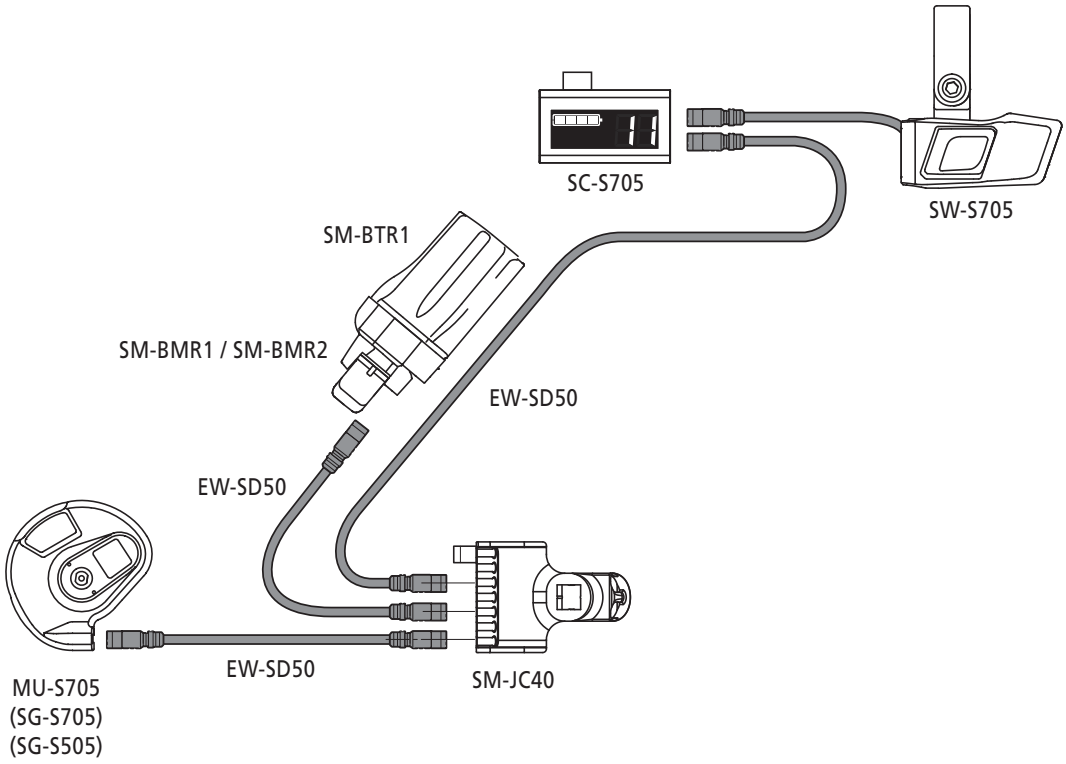


CONNECTION OF THE ELECTRIC WIRES

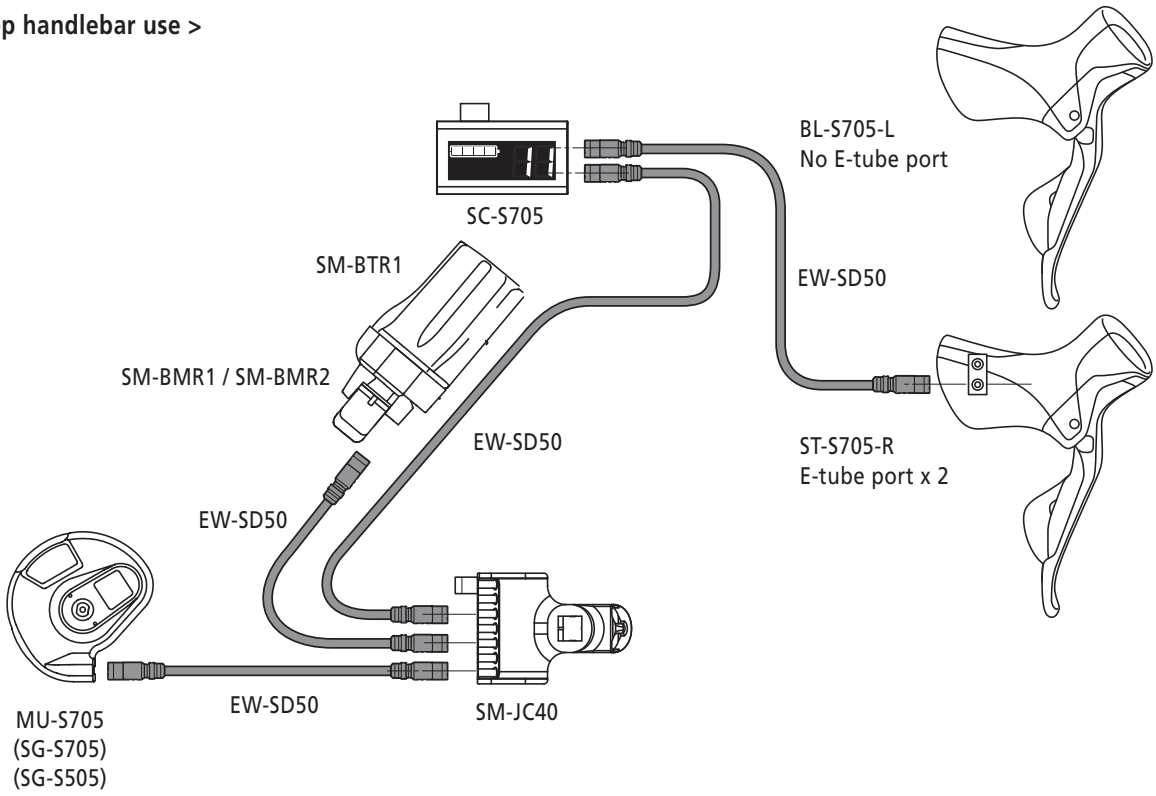
■ Overall wiring diagram

External battery specifications < SM-JC40 (Junction (B) : external type) >

< Flat handlebar use >

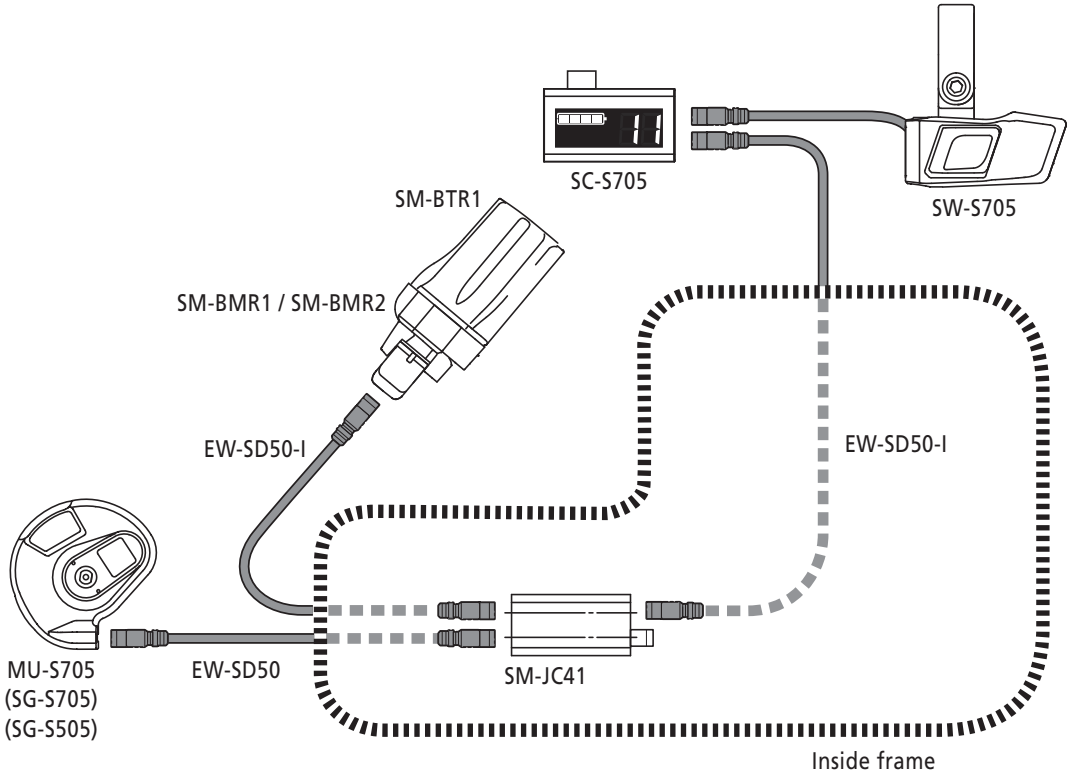


< Drop handlebar use >

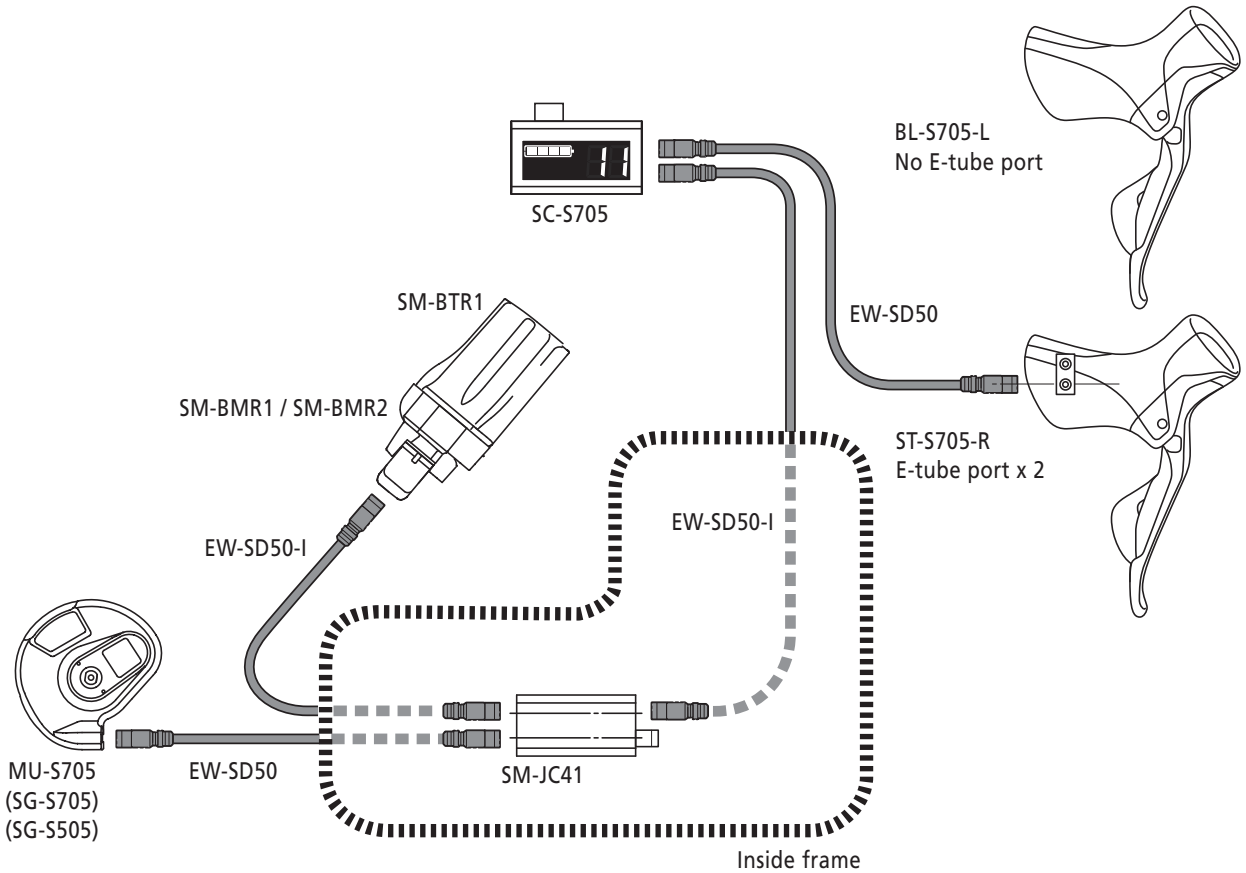


External battery specifications < SM-JC41 (Junction (B) : built-in type) >

< Flat handlebar use >

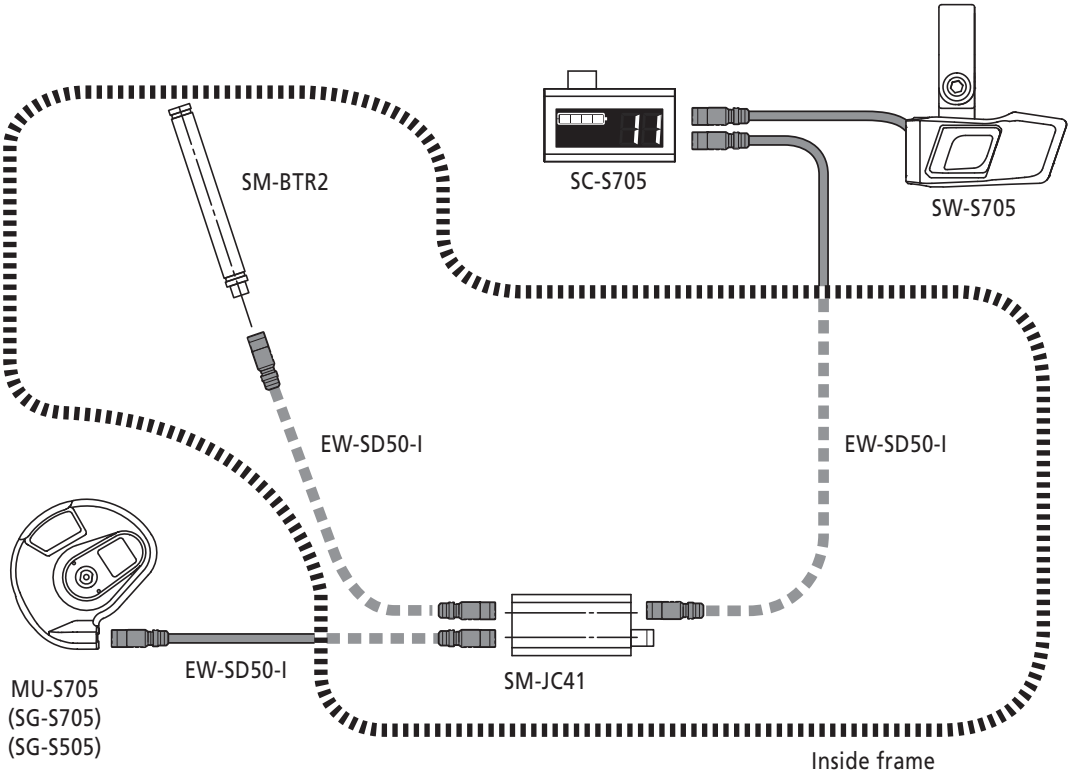


< Drop handlebar use >

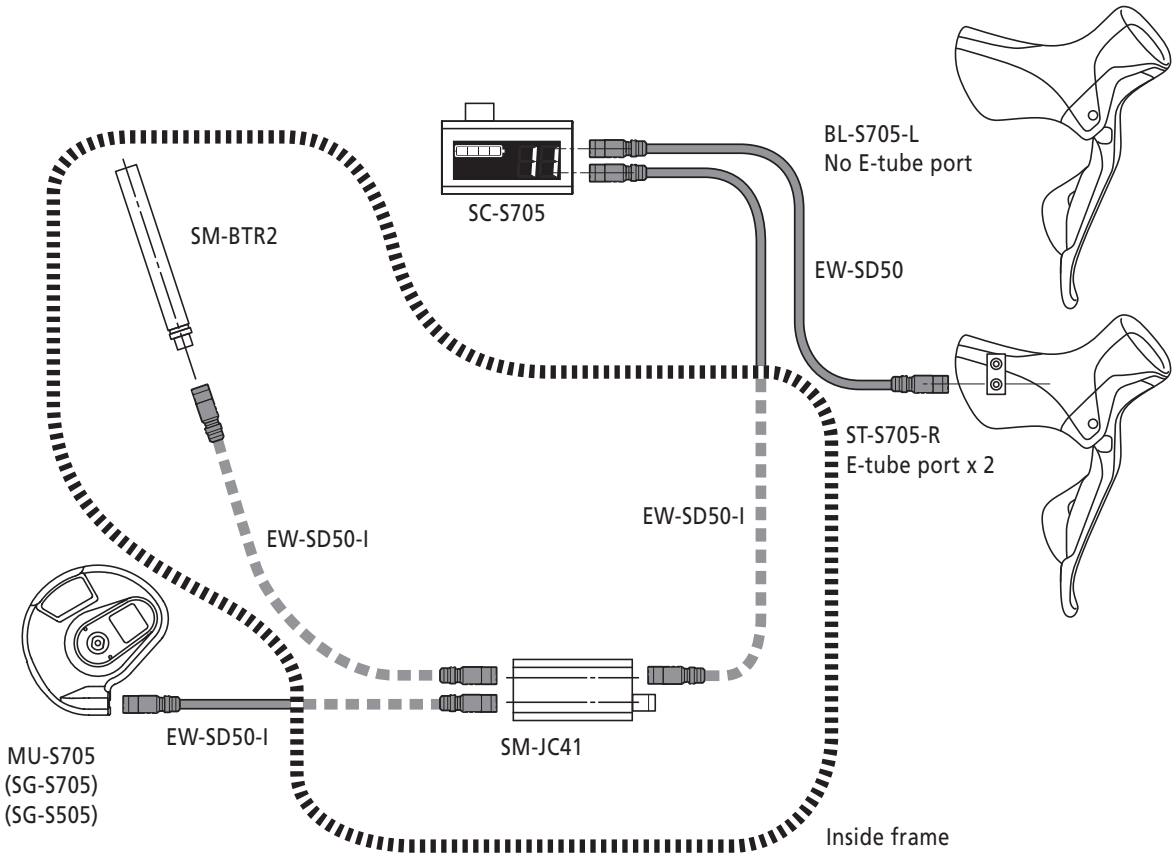


Built-in battery mount type < SM-JC41 (Junction (B) : built-in type) >

< Flat handlebar use >



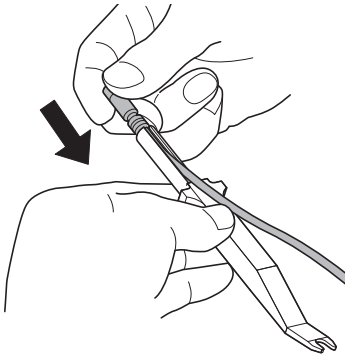
< Drop handlebar use >



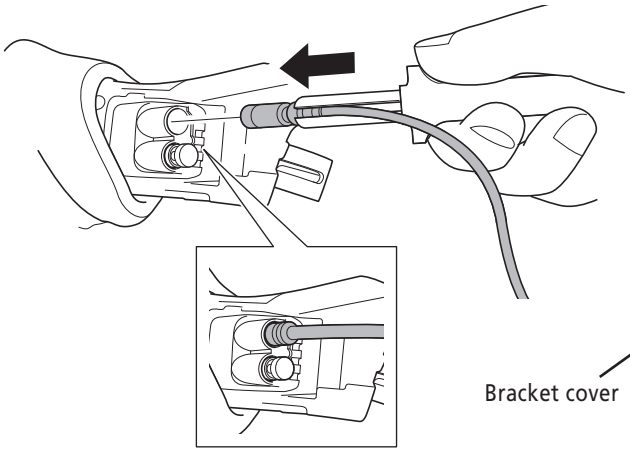
■ Connection to the dual control lever

When routing the electric wires, allow enough looseness in the cable so that the dual control lever, shifting switch installation position can be adjusted and so that the handlebars can be turned fully to the left and right.
The electric wire for the dual control lever can be wound around the handle when the bar tape is wrapped.

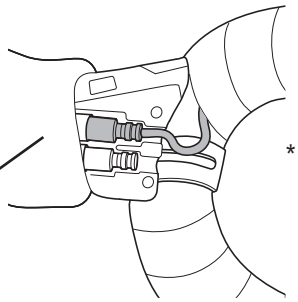
1. Use the TL-EW02 special tool to connect to the products.
Set so that the projection on the connector is aligned with the groove on the narrow end.



2. Open up the bracket cover and lift up the connector cover. Use the TL-EW02 to connect the connector of the electric wire to the terminal on the lever side.



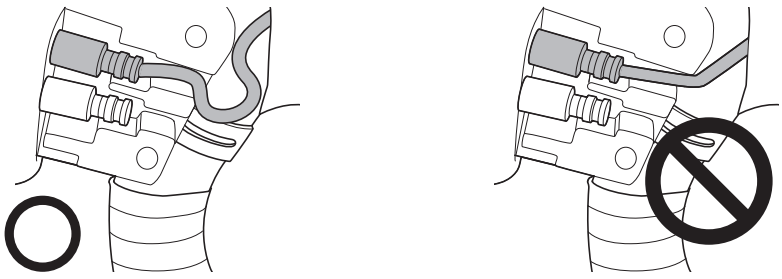
Bracket cover



* The remaining terminal can be used for an additional satellite switch or the SM-PCE1.

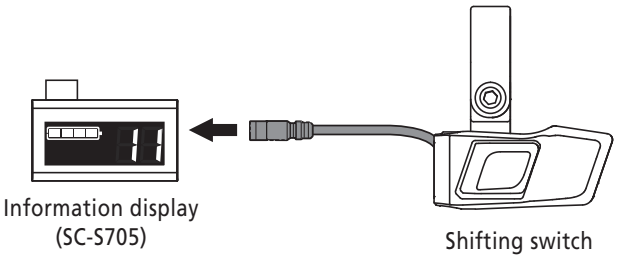
Note:

- The electric wire could be pulled by gripping and rolling bar-tape.
  To prevent wire coming off from dual control lever, keep the length margin of electric wire at bracket cover even after bar-tape is rolled up.
- This length margin of electric wire is also necessary to open the bracket cover when additional switch and the SM-PCE1 is connected.

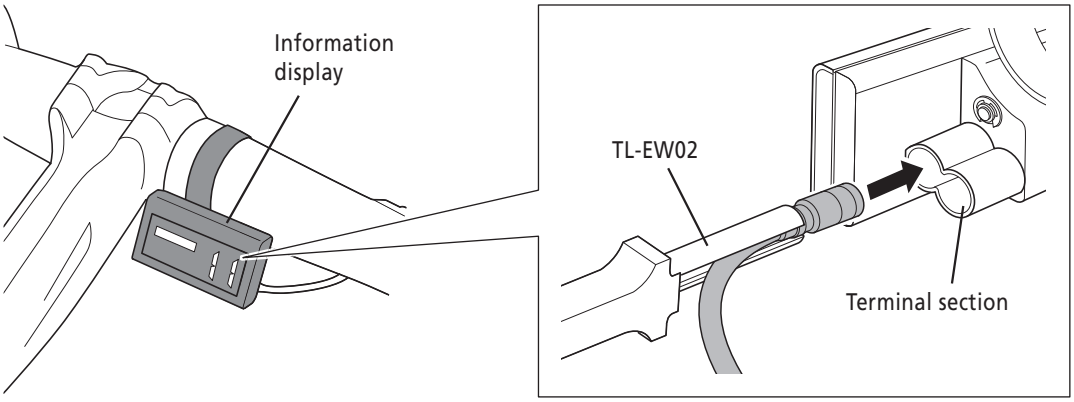


■ Connection to the shifting switch / Information display

Connect the electric wire of the shifting switch to the information display (SC-S705) using TL-EW02.



Attach the electric wire using TL-EW02.

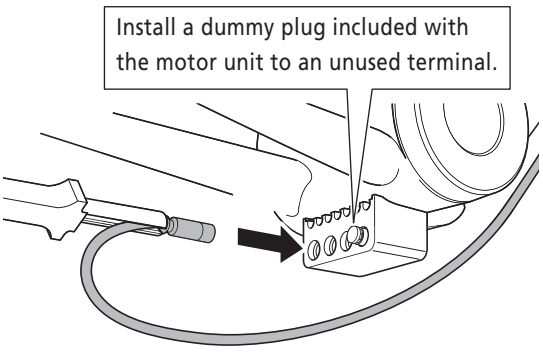


Note:
Be sure to push them together until they connect with a click.

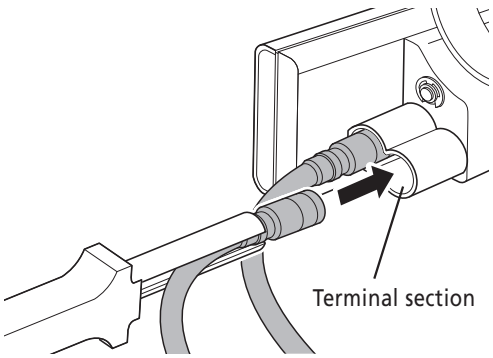
■ Connection of junction

External battery mount type (SM-JC40)

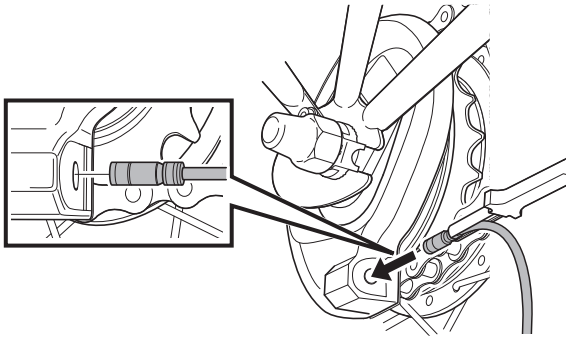
1. Connect the electric wire to the SC-S705 terminal section and junction (B).
Be sure to push them together until they connect with a click.

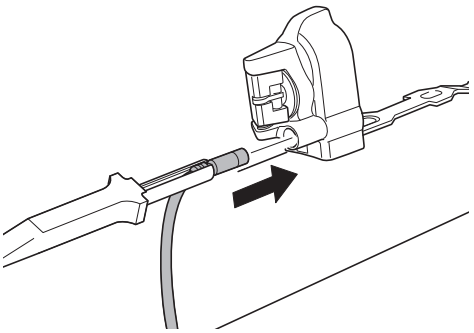


Junction (B)



2. Connect the electric wires to the motor unit and the battery mount.

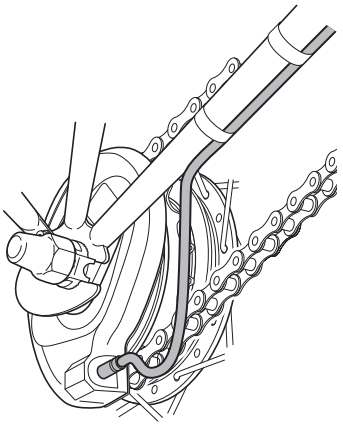




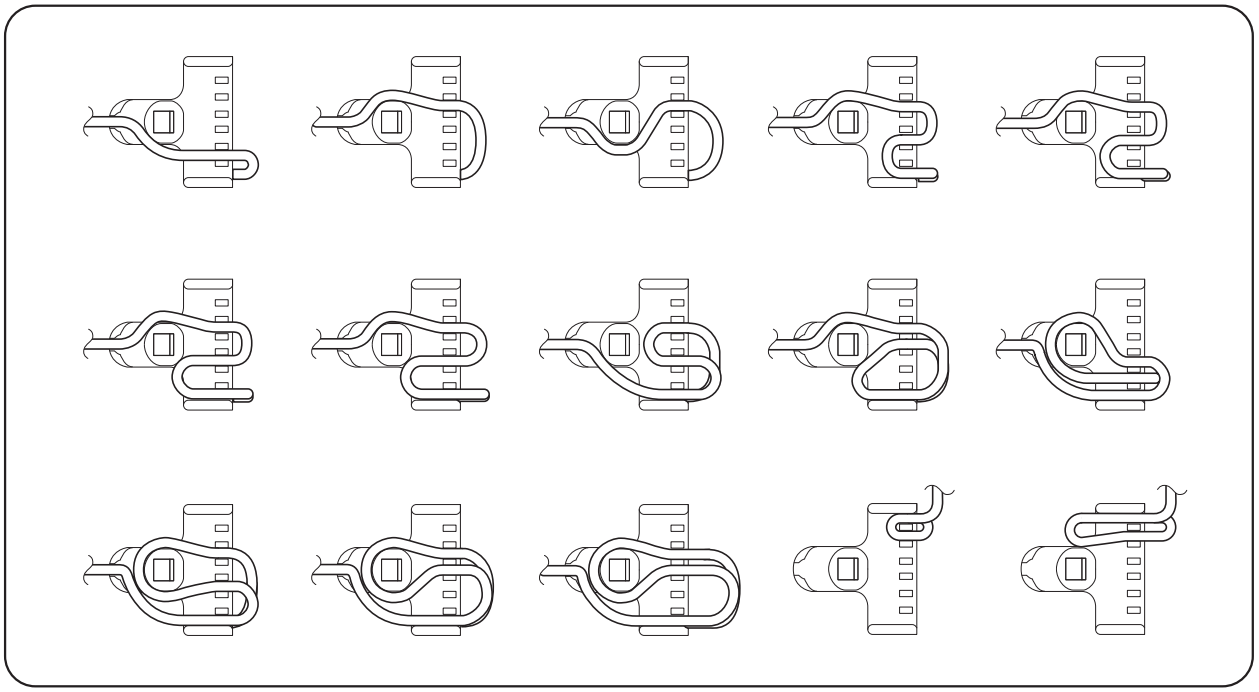
At battery mount

3. Provisionally secure the electric wire along the frame with tape, and then connect it to junction (B).

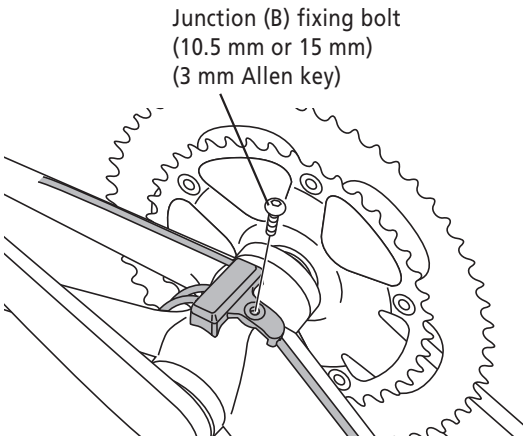
* When routing the electric wire to the motor unit, be sure to install it to the bottom of the chainstay to avoid any interference between the cable and the chain.
* Wind any excess length of electric wire inside junction (B) to adjust the length.



Example of adjusting junction (B) length

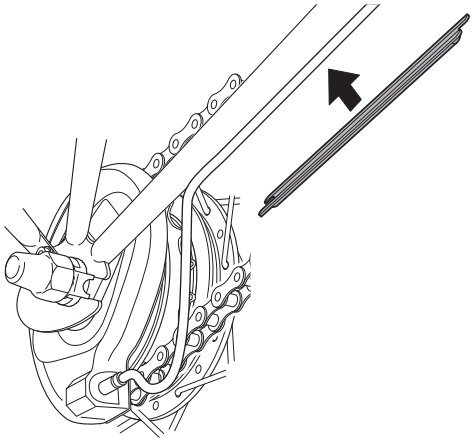


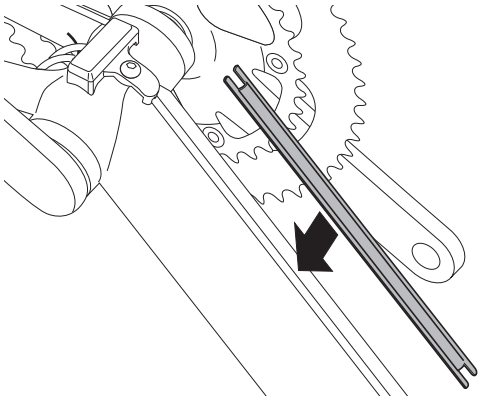
4. Once the electric wires have been routed, secure junction (B) underneath the bottom bracket shell.



Tightening torque:
1.5 - 2.0 N·m {13.1- 17.5 in. lbs.}

5. Next, install the electric wire cover to the frame.
In order to make sure that the electric wire cover is securely installed, clean the frame with alcohol or some other cleaning agent to remove any grease or other substances before installing the cover.
Place the electric wire cover over the electric wires, and then attach it to the frame.



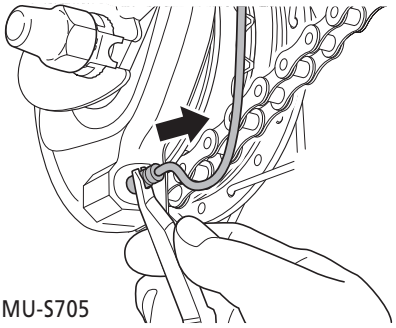


Checking connections

After connecting the electric wires to all of the components, install the battery and check the operation.
Check that gear-shifting of the rear can be performed properly by operating the shifting switch.

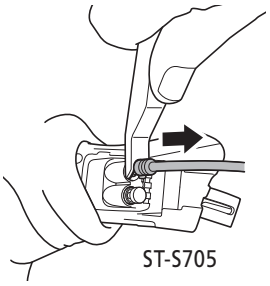
Disconnection of the electric wires

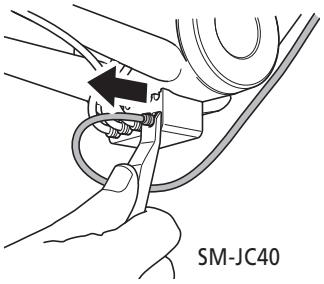
This is a small waterproof connector. Do not repeat connecting and disconnecting it. The waterproof section or the connecting section may become worn or deformed, and the function may be affected.

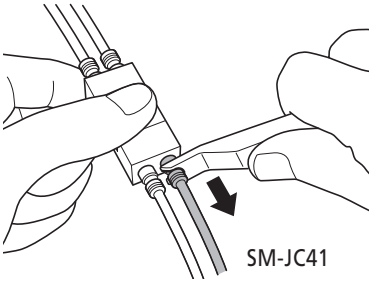

MU-S705

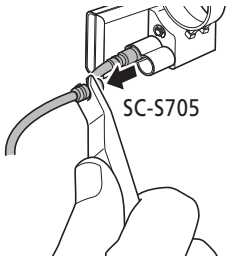
Use the wide end of the TL-EW02 special tool to disconnect the electric wires. If you pull too firmly on the connectors, problems with operation may occur. Insert the special tool so that the flat side is facing toward the derailleur, and then tilt it so as to pull out the connector of the electric wire.

When disconnecting the electric wire from a lever, face the flat side toward the lever. When disconnecting the connector of junction, insert the special tool so that the flat side is facing toward junction.


ST-S705


SM-JC40


SM-JC41

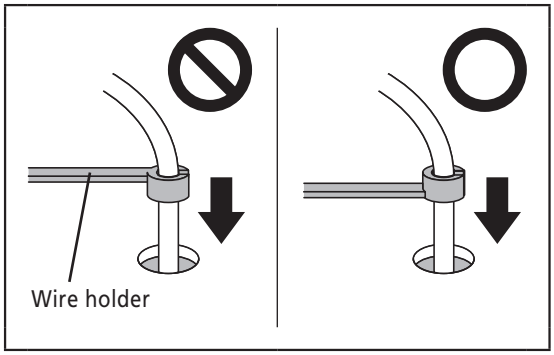

SC-S705

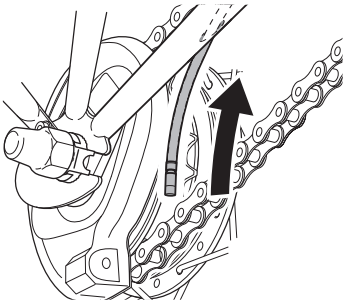
* Run any excess length of electric wire along the handlebar, and use zip tie or similar to secure the electric wire to the handlebar.

Built-in battery mount type (SM-JC41)

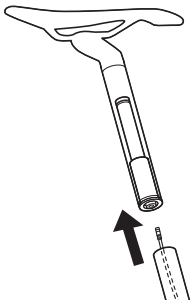
1. First, insert the electric wire for each of SC-S705, the battery mount, and the motor unit through the hole in the frame to the hanger section.

* The electric wires have a correct way of being inserted. Make sure that you insert them from the direction shown in the illustration.

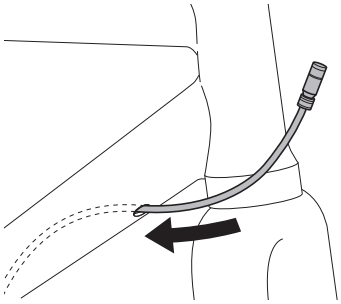




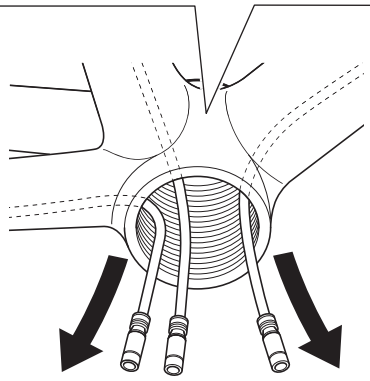
Electric wire for motor unit



Electric wire for built-in battery

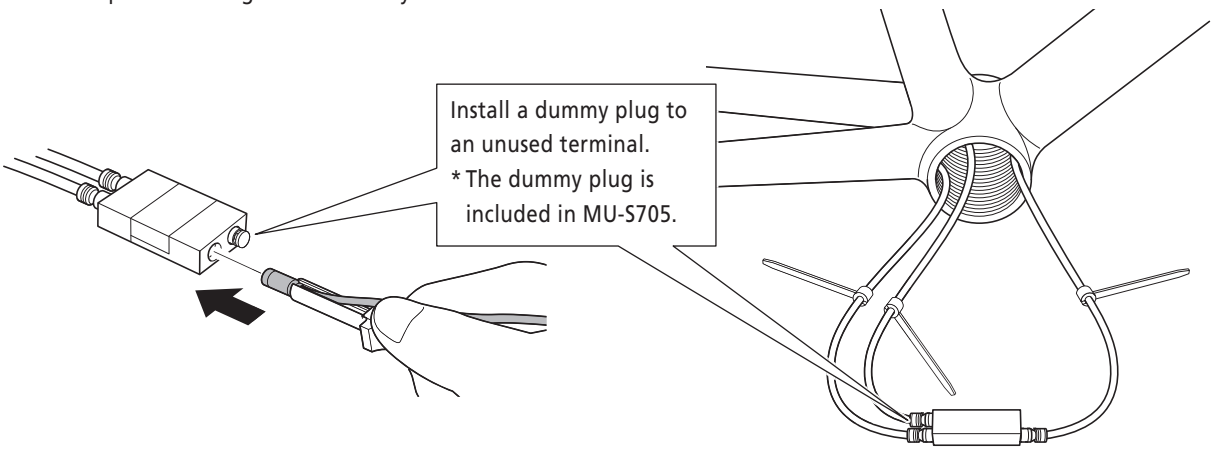


Electric wire for SC-S705

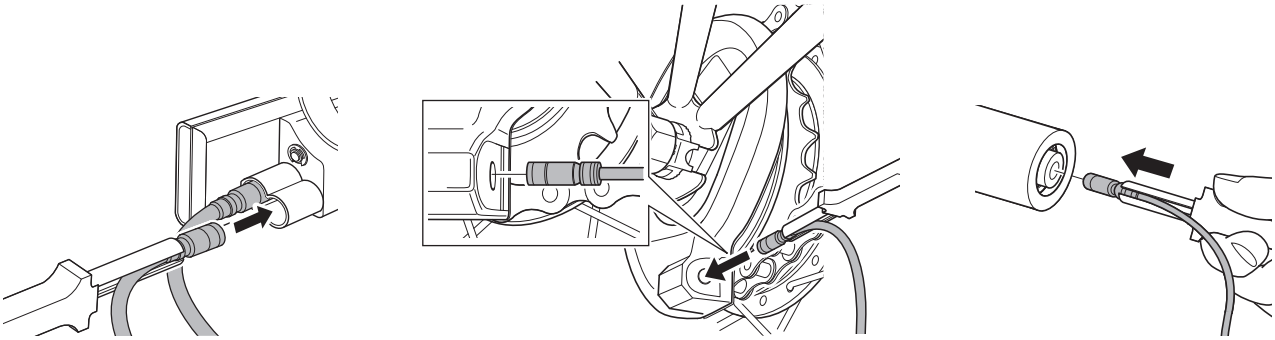


Bottom bracket shell

2. Connect each electric wire to junction (B).
Be sure to push them together until they connect with a click.



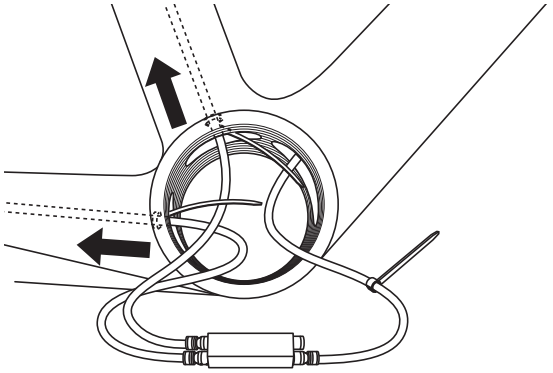
3. Connect the electric wires to SC-S705, the motor unit and the battery mount.



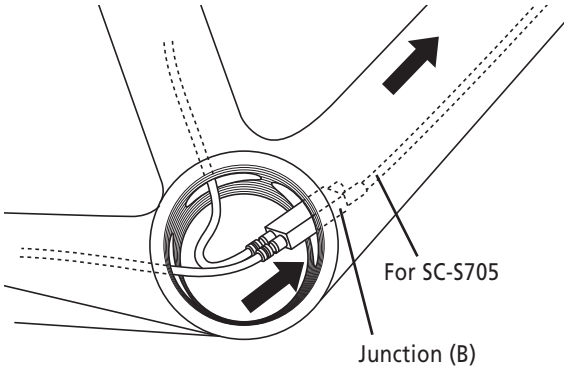
SC-S705 | Motor unit | Battery mount

Routing junction (B) and the electric wires inside the frame

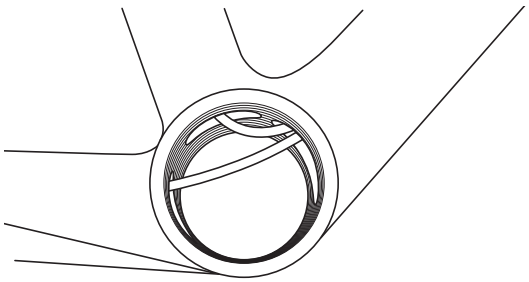
1. Pass the electric wires for the motor unit and the built-in battery through the chainstay and the seat tube, respectively.



2. Pass the electric wire for SC-S705 and junction (B) through the down tube. Check that the screws of the bottom bracket shell do not damage any of the components at this time.

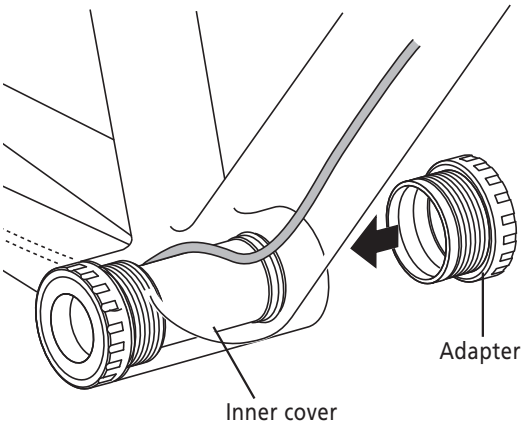


3. Make only the electric wires for the motor unit and the built-in battery visible inside the hanger; push unnecessary protruding components such as the wire holder into the frame.

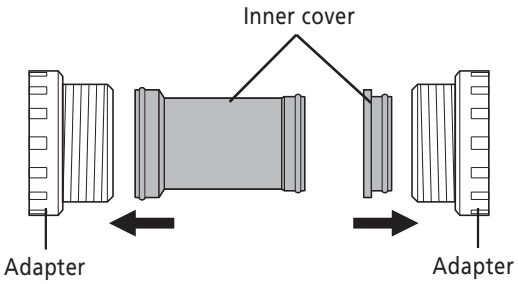


Assembly of the bottom bracket shell

1. When installing the inner cover to the hanger, pass the electric wires for the motor unit and the built-in battery over the inner cover.



2. Install the inner cover to the bottom bracket adapter.

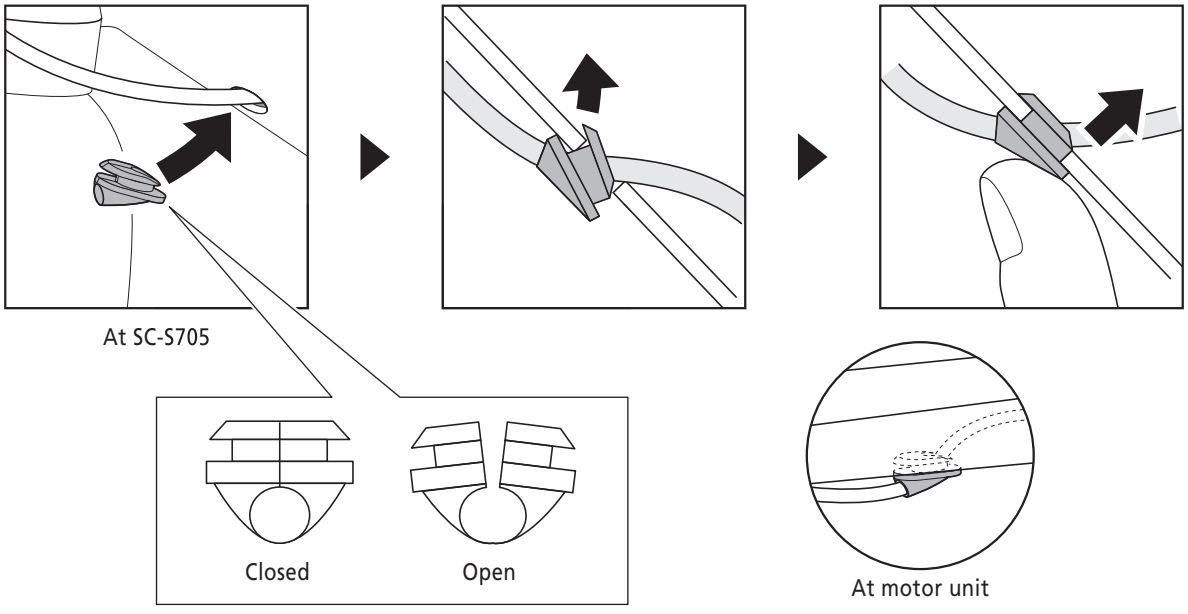


Note:

* If using a frame which does not have enough space between the inside of the bottom bracket shell and the inner cover to route the electric wires, use an inner cover which is sold separately.

Installation of the grommets

Install grommets in appropriate positions for the electric wires by inserting the bottoms into the holes in the frame and then pushing the tops to fit them into place.



MAINTENANCE

■ Battery level indicator

Charging needed

* If the battery level is ZERO, not displayed on screen.

- When the battery level is low, the motor unit stops operating.
  When the battery is completely drained, the motor unit is fixed at the last gear position.
- When the battery indicator is at a level that requires charging, it is recommended that the battery be charged soon.

■ System power reset

< SM-BTR1 >

After the battery is removed, about one minute is usually required for the system power to reset.

< SM-BTR2 >

Disconnect the plug from SM-BTR2. After about one minute, insert the plug.

■ Troubleshooting

	Symptoms	Remedies
MU-S705	Information display does not show the number of the gears.	Check if motor unit is connected.
	Abnormal noise occurs during riding or pedaling gives an unusual feel.	Adjust motor unit. (Refer to the next page)
SC-S705	The number of the gears on information display does not change.	Check if motor unit is connected.

* Unusual feels during pedaling refer to conditions such as momentary hooking or gear engagement skipping.

■ Adjusting motor unit

⚠ CAUTION

- Improper adjustment may cause gear engagement skipping, resulting in an accidental fall.
- Perform adjustment only when you have an unusual feel during shifting. If there is no problem with shifting, unnecessary adjustment may worsen shifting performance.

1. Download the latest version of E-tube project from the support website.
(http://e-tubeproject.shimano.com)

2. Connect SM-PCE1 or SM-BCR2. Connect the battery when connecting SM-BCR2.

3. Activate the adjustment setting mode in the E-tube Project.

4. Check that the adjustment value is set to 0 (default) in the E-tube Project. (Illustration A below)

4-1. The value is set to 0: Go to step ***5***

4-2. The value is set to other than 0: Adjust the value to 0 and shift gears to check whether abnormal noise or unusual feels have been eliminated. At this time, shift gears via the E-tube Project. (Illustration B below)

The problem persists: Go to step ***5***

The problem has been remedied: Go to step ***6***

5. Change the adjustment value by one in the + or - direction in the E-tube Project (Illustration A below), and check the sound or feel of gear shifting. At this time, shift gears via the E-tube Project. (Illustration B below)

5-1. The problem has been remedied: Check the sound or feel of gear shifting again while changing the adjustment value one by one in the same direction.
Continue adjusting the value until the abnormal noise or unusual feels are eliminated.

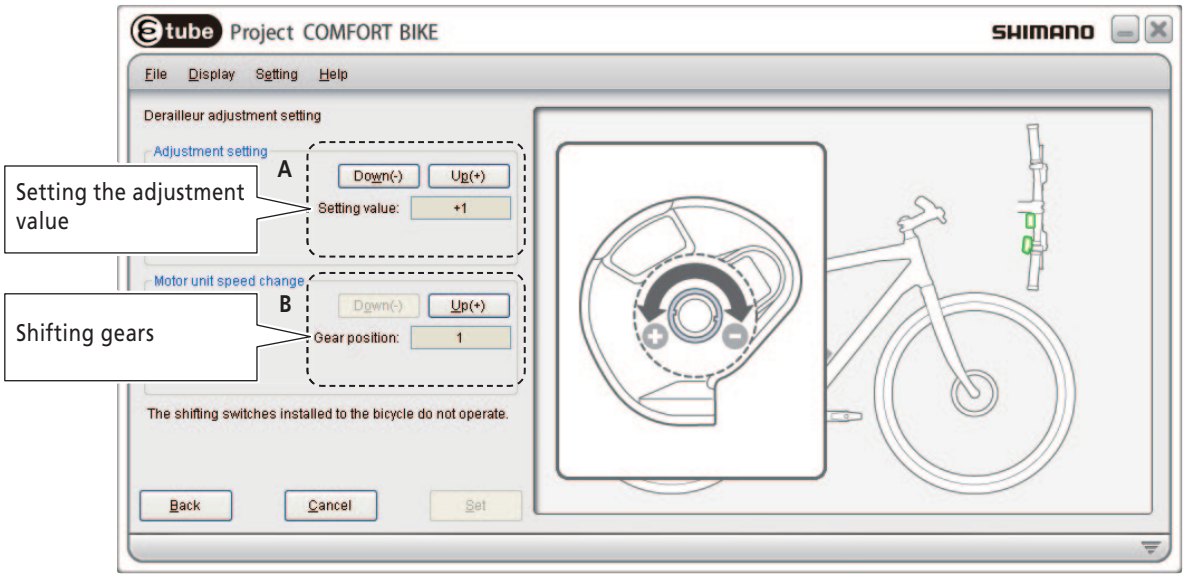
5-2. No sign of improvement: Change the adjustment value by one again in the same direction and then check the sound or feel of gear shifting again.

The problem has been remedied: Go to step ***5-1***

The condition has worsened: Go to step ***5-3***

5-3. The condition has worsened: Change the adjustment value by two in the opposite direction and then check the sound or feel of gear shifting again.
Continue adjusting the value by one in the same direction until the abnormal noise or unusual feels are eliminated.

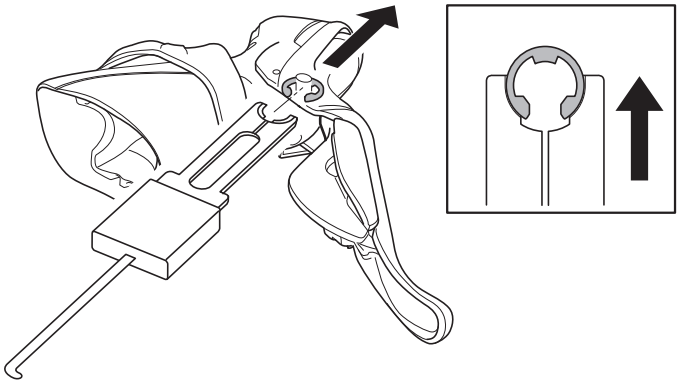
6. Finally, ride the bicycle to check whether there is no problem.

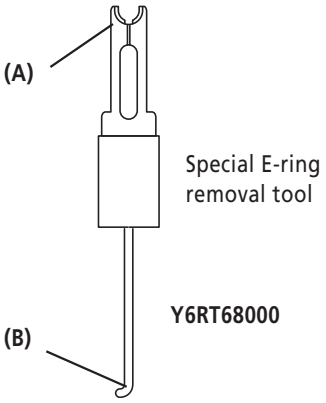


In addition to English, seven other languages are available on E-tube project.
(Japanese/English/German/French/Italian/Chinese/Dutch/Spanish)

■ Disassembly of the bracket unit and lever unit

1. Use the special tool which is sold separately to remove the E-ring.
Align part B of the special tool with the removal direction of the E-ring. Next, set part A onto the E-ring and remove the E-ring.

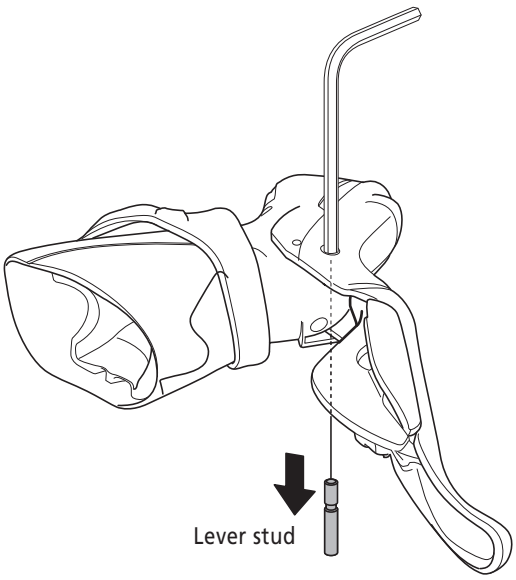




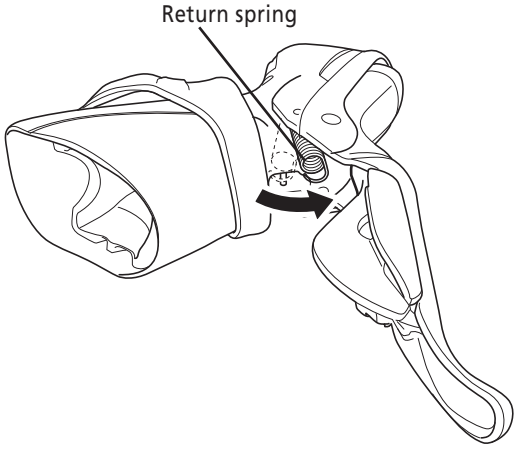
Note:

* The E-ring may fly off suddenly during removal, so check that there are no people or objects nearby while removing the E-ring.

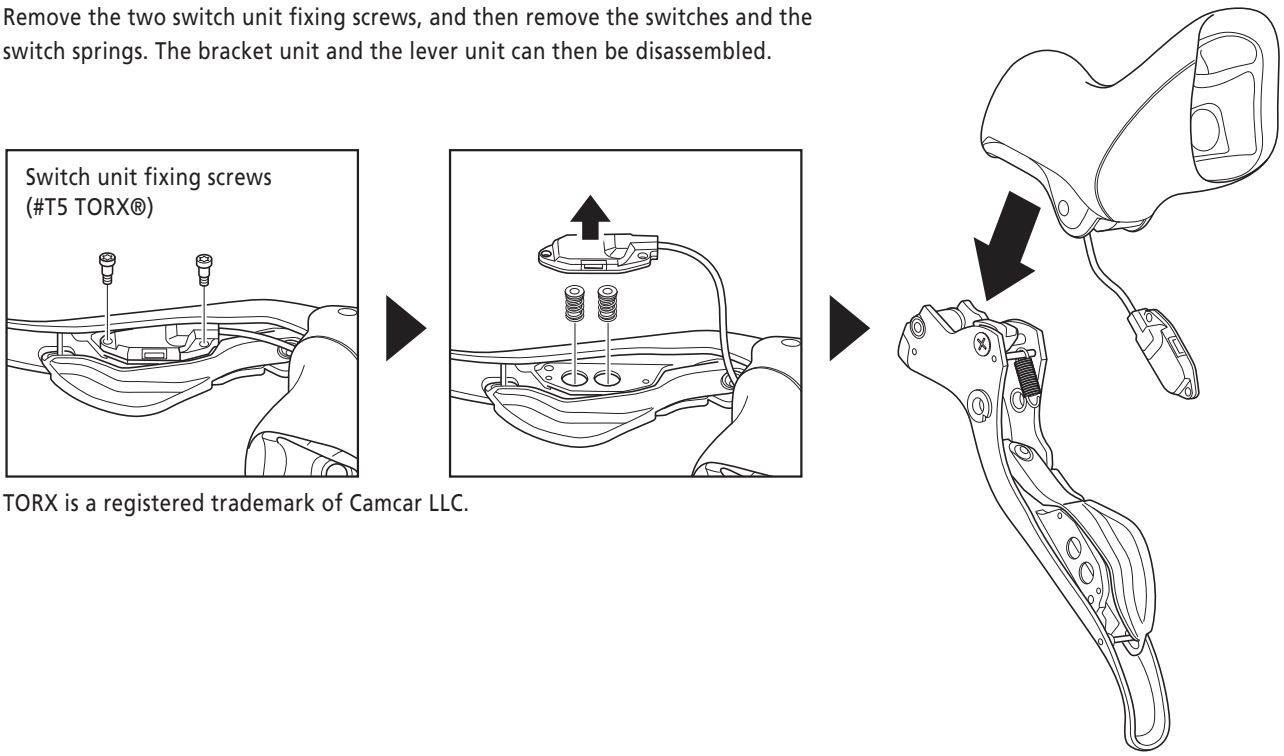
2. Insert an Allen key or a similar tool into the hole in the lever stud, and then tap it with a plastic mallet to push out the lever stud.



3. Remove the return spring.



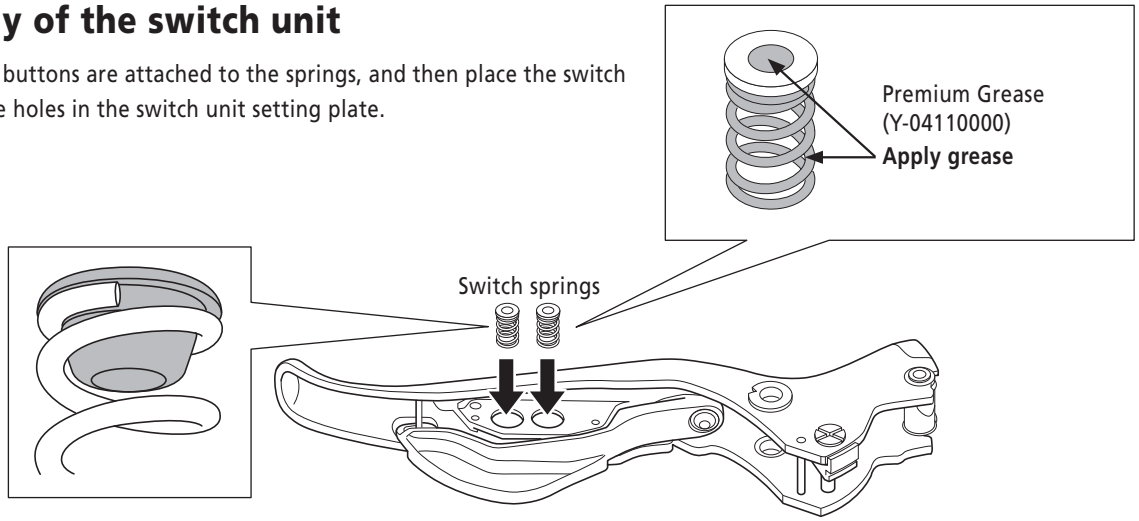
4. Remove the two switch unit fixing screws, and then remove the switches and the switch springs. The bracket unit and the lever unit can then be disassembled.



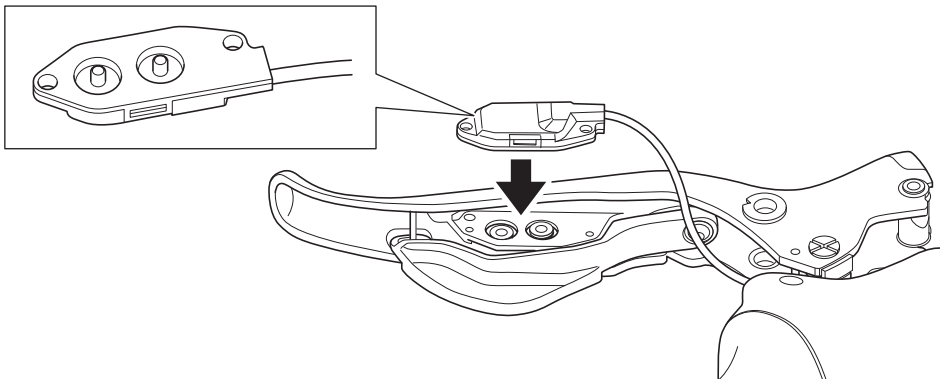
TORX is a registered trademark of Camcar LLC.

■ Assembly of the switch unit

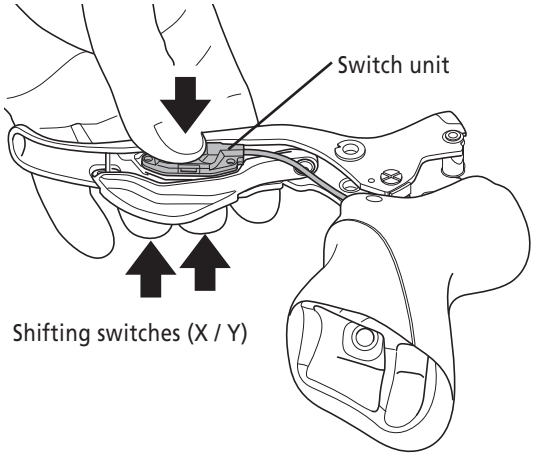
1. Check that the buttons are attached to the springs, and then place the switch springs into the holes in the switch unit setting plate.



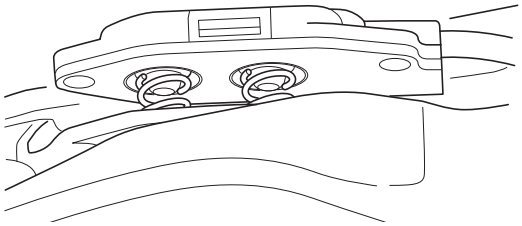
2. Place the switch unit against the mounting surface of the switch unit setting plate.



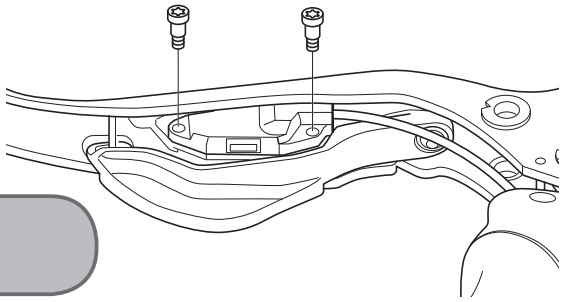
3. Press the switch unit by hand so that the switch springs go into the grooves in the buttons, and then push the shifting switches (X and Y) in as far as they will go.



4. Make a gap between the switch unit and the switch unit setting plate and check that the end of the rubber on the switch unit is on the button.



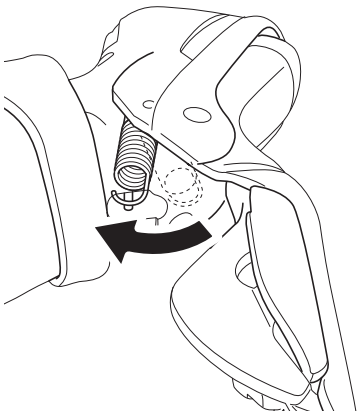
5. Return the switch unit to the setting position for the switch unit setting plate, and while pressing it by hand, operate the shifting switches (X and Y) once more and check that the switches turn on. Install the switch using the switch unit fixing screws.



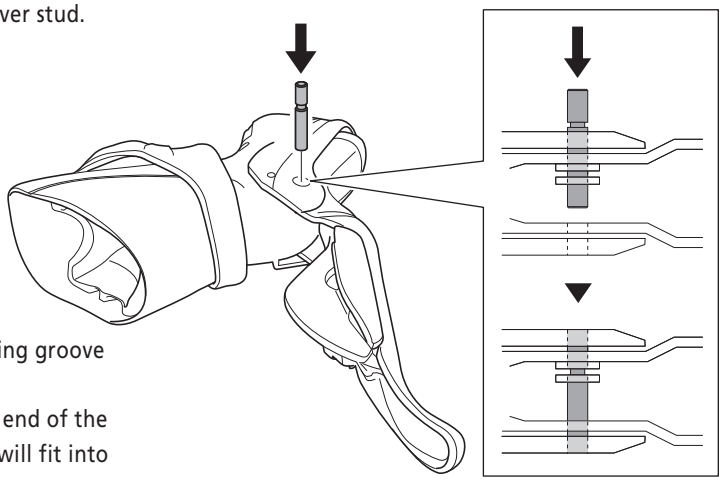
Tightening torque:
0.18 N·m {1.57 in. lbs.}

■ Assembly of the bracket unit and lever unit

1. Assemble the bracket unit and the lever unit, and then attach the return spring.

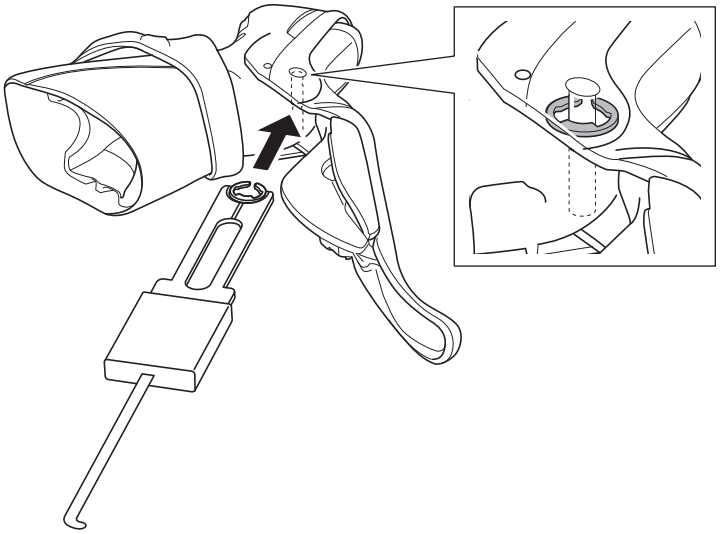


2. Align with the hole in the stud, and then press-fit the lever stud.



* The correct direction for the lever stud is when the E-ring groove is at the top.
* Check that the surface of the bracket unit and the top end of the lever stud are flush with each other so that the E-ring will fit into the groove.

3. Use part A of the special tool to install the E-ring.



* Operate the shifting switches (X and Y) and check that they turn on, and check that the lever operates smoothly.

Carry out maintenance after a travel of 1,000km from the first use of the bicycle, and after that, once every two years (once every 5,000km if the bicycle is used very frequently).

■ In the case of 8-speed internal geared hub < Oil maintenance kit : Y00298010 >

Fill the bottle with WB oil to a height of 95mm.

Immerse the internal unit into the oil from the left side. Immerse until the oil reaches up to ring gear unit 1.

Keep the internal unit immersed as illustrated for approximately 90 seconds.

Remove the internal unit from the oil.

Let the excess oil drain off for approximately 60 seconds.

After lubrication is complete, reassemble by following the usual procedure.

■ In the case of 11-speed internal geared hub < Oil maintenance kit : Y13098023 >

Tools including the kit	Syringe, Tube, Bleed nipple, O ring, Container

General Safety Information

⚠ WARNING

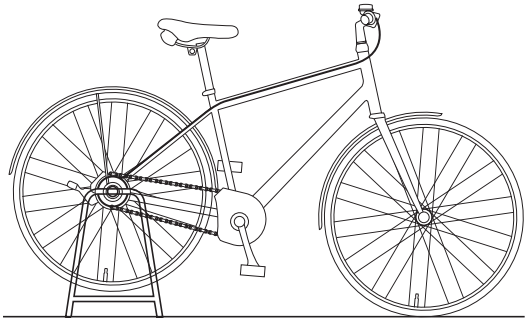
- When changing the oil, be careful that no oil gets on the disc brake rotor, brake pads, on the rim when using rim brakes, etc. If oil gets on any of these parts, there is a danger that brake performance may be reduced. Take care of this problem according to the procedures in the brake instruction manual.
- Since there is a risk of explosion or fire, do not smoke, eat, or drink while using this oil. In addition, keep it away from ignition sources such as heat, sparks, open flames, or high temperatures and prevent it from catching fire due to static electricity sparks or other sparks.
- Use only outdoors or in a well-ventilated area. Inhalation of oil mist or vapors may cause nausea. Be careful to provide ventilation and use a respirator-type mask.
  If mist or vapor is inhaled by mistake, go immediately to an area with fresh air. Stay warm and quiet, and seek professional medical advice if required. If breathing stops, perform artificial respiration, and if breathing is difficult, provide the affected person with oxygen.

Cautions regarding handling of SG-S700 Oil :

- Use safety glasses when handling, and avoid contact with eyes. Contact with eyes may result in irritation.
  In the event of eye contact, flush with fresh water and seek medical assistance immediately.
- Use gloves when handling. Contact with skin may cause a rash and discomfort.
  In the event of skin contact, wash well with soap and water.
  If skin condition becomes abnormal, seek medical assistance immediately.
- Do not drink the oil. If it is drunk by mistake, do not induce vomiting. Make the affected person drink 1 to 2 cups of water and seek medical assistance immediately.
  If the affected person loses consciousness, do not give the person anything by their mouth. If vomiting occurs naturally, tilt the body to prevent inhalation.
- After use, be sure to wash hands thoroughly.
- When storing, close the container tightly to prevent water or foreign materials from entering. Store out of reach of children. Do not store in areas subject to direct sunlight, areas subject to temperatures above 40°C, areas subject to water or high humidity where rust is likely to occur, or in areas where there is a risk of freezing.
- Dispose of used oil, old oil, or oil used for cleaning in accordance with applicable local laws and regulations.
- To maintain product performance, oil should be changed after the first 1,000 km from start of use of the product, and once every 2 years thereafter (after every 5,000 km if bicycle is ridden frequently).
- When performing maintenance, use only Shimano SG-S700 OIL. Use of other oils may cause problems such as oil leakage, faulty operation of speed changer, etc.
- When using a 1L can of oil, it may become impossible to suck out oil with a syringe when there is only a little oil left. First, transfer all oil to a different container.
- Read these instructions carefully, and keep them in a safe place for later reference.

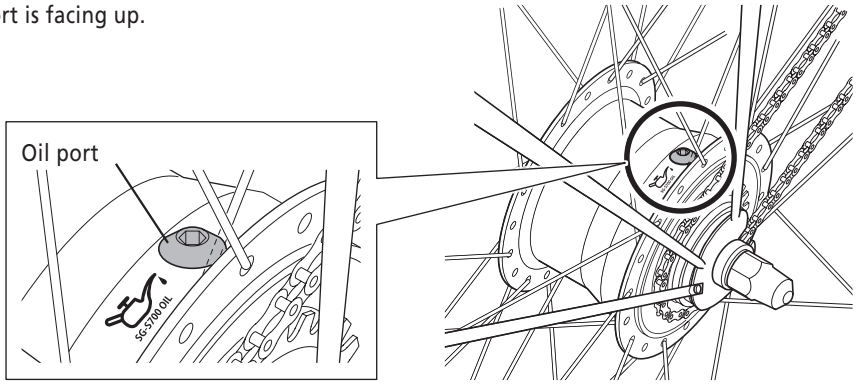
Internal geared hub: Oil replacement

Using a stand, etc., enable the rear wheel to turn while performing work.

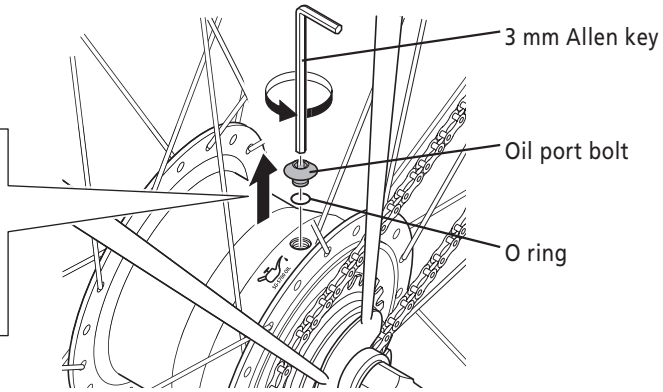


< Drain out the old oil >

1. Rotate the wheel slowly until the oil port is facing up.



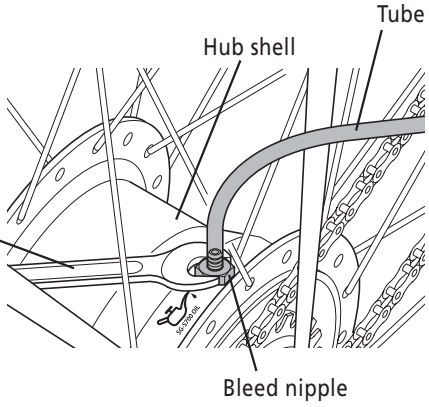
2. Remove the oil port bolt and O-ring.



Note:
Be careful that the oil port is facing up. If the oil port bolt is loosened when it is not facing up, the oil inside may leak out.

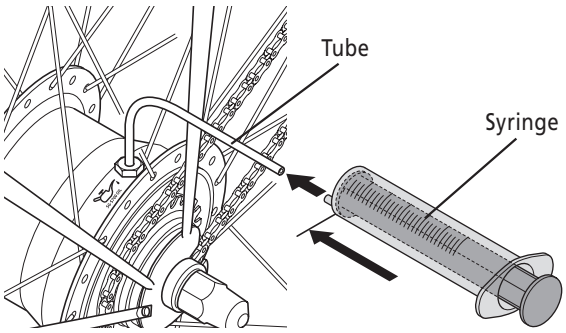
3. Attach the bleed nipple with tube attached to the hub shell.

* Check that the O-ring is properly installed on the bleed nipple.

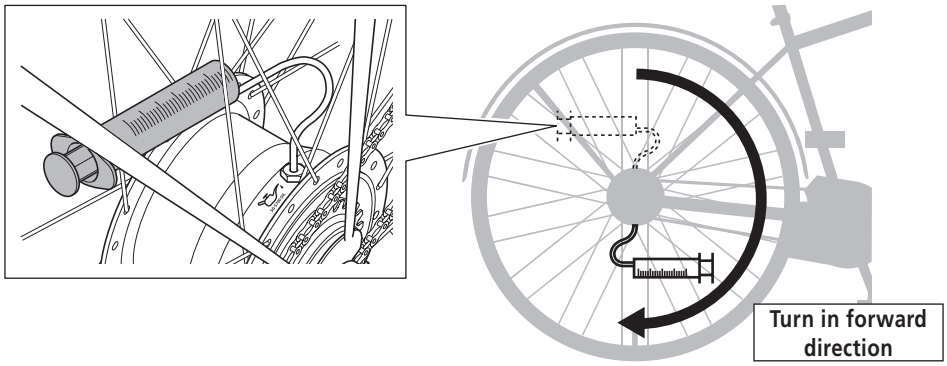


Tightening torque:
1.0 - 3.0 N·m {9 - 26 in. lbs.}

4. With the piston of the syringe pushed fully in, firmly connect the syringe to the tube.

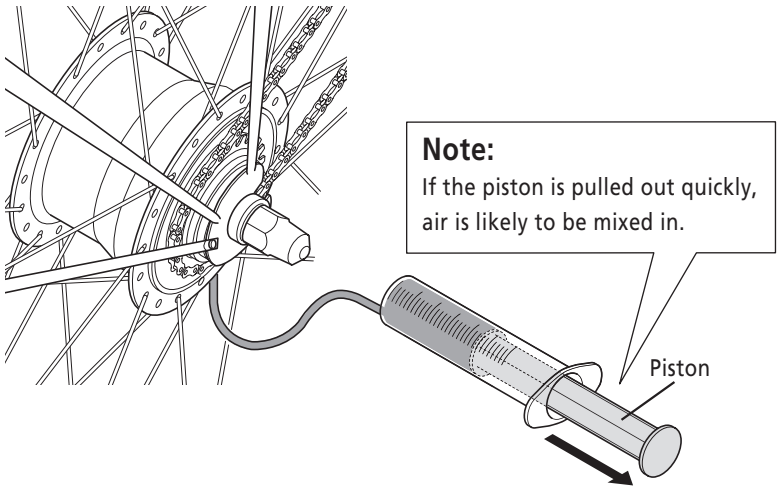


5. Insert the syringe between the spokes, and slowly turn the wheel forward until the oil port is facing down.

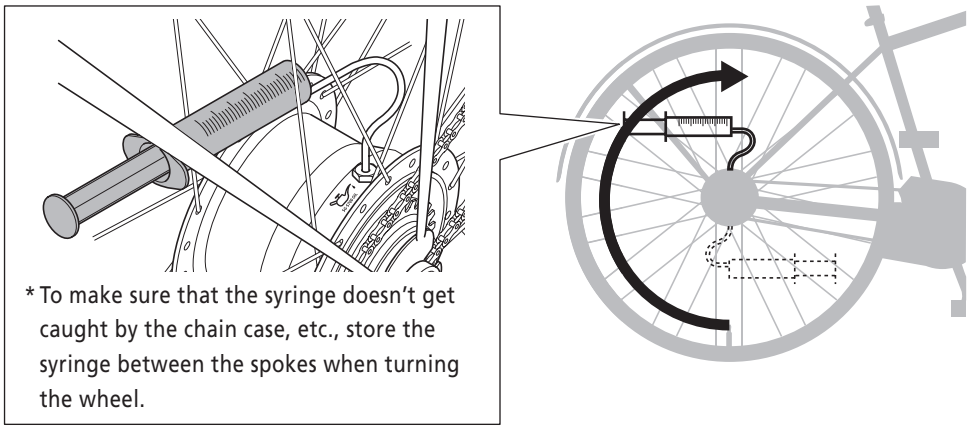


6. Wait about 5 minutes with the hub kept still and not turning so that the oil settles.

7. Pull the piston out slowly to draw out the oil inside the hub shell.

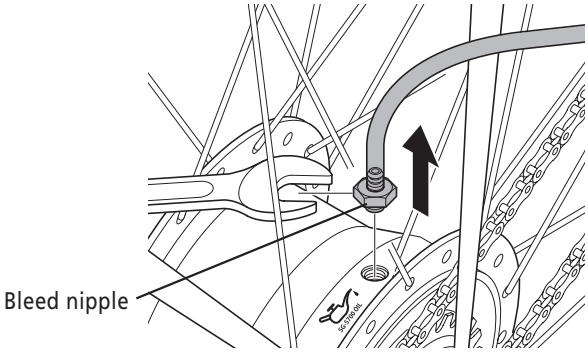


8. Slowly turn the wheel so that the oil port is facing up.

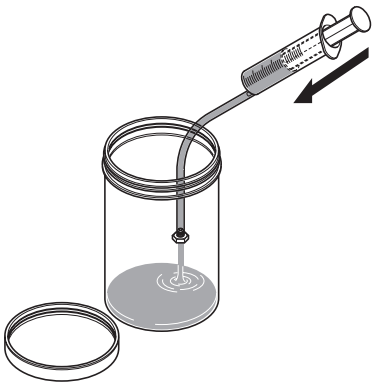


* To make sure that the syringe doesn't get caught by the chain case, etc., store the syringe between the spokes when turning the wheel.

9. While being careful that the tube does not come off the syringe, remove the bleed nipple.



10. Remove the old oil from the syringe.



< Cleaning the inside >

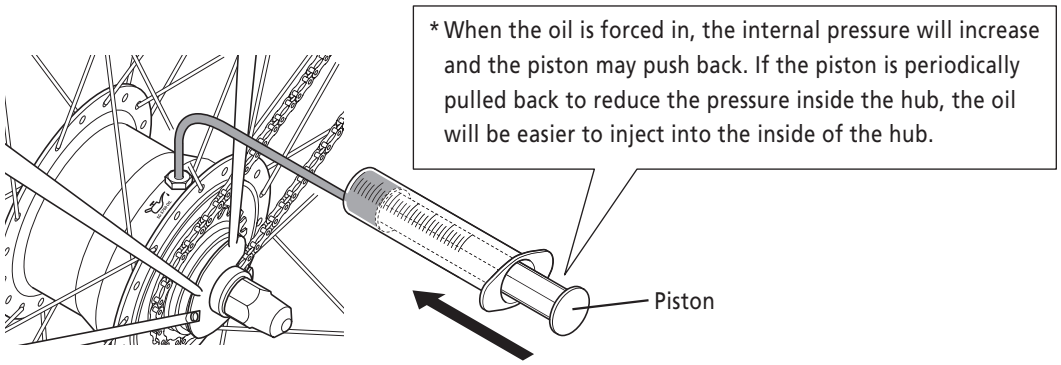
1. Attach the bleed nipple to the hub shell.

Tightening torque:
1.0 - 3.0 N·m {9 - 26 in. lbs.}

2. Suck 25 ml of new oil into the syringe and connect it firmly to the tube.

* If the syringe or tube becomes dirty when removing old oil or cleaning the inside of the hub, clean the syringe and tube using parts cleaner, etc. if necessary.

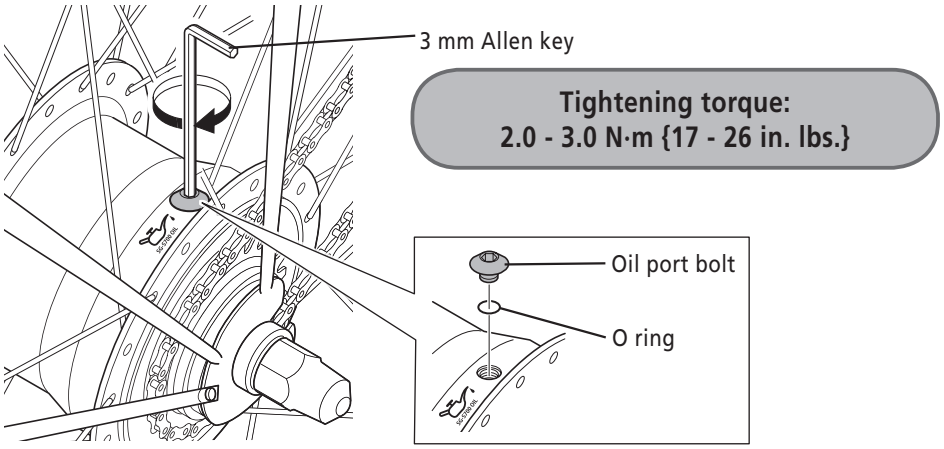
3. Push the piston to inject the new oil into the inside of the hub.



4. After pulling back the piston to reduce the internal pressure, remove the bleed nipple.

* If the bleed nipple is removed without pulling back the piston, the oil may flow back into the piston together with air from inside the tube and spill out of the piston.

5. Install the O-ring and the oil port bolt.



6. While performing gear-change operations, turn the pedals to turn the wheel for about 1 minute.

7. Keep the wheel still without rotating for about 1 minute.

8. Remove the oil from inside by following Procedure **< Drain out the old oil >** above.

< Injecting new oil >

1. Inject 25 ml of new oil into the hub by following steps **< Cleaning the inside >** ***1.*** to ***5.*** above.

2. Clean off any oil that may have gotten on the hub, etc.

SHIMANO

SHIMANO AMERICAN CORPORATION
One Holland, Irvine, California 92618, U.S.A. Phone: +1-949-951-5003

SHIMANO EUROPE B.V.
Industrieweg 24, 8071 CT Nunspeet, The Netherlands Phone: +31-341-272222

SHIMANO INC.
3-77 Oimatsu-cho, Sakai-ku, Sakai-shi, Osaka 590-8577, Japan